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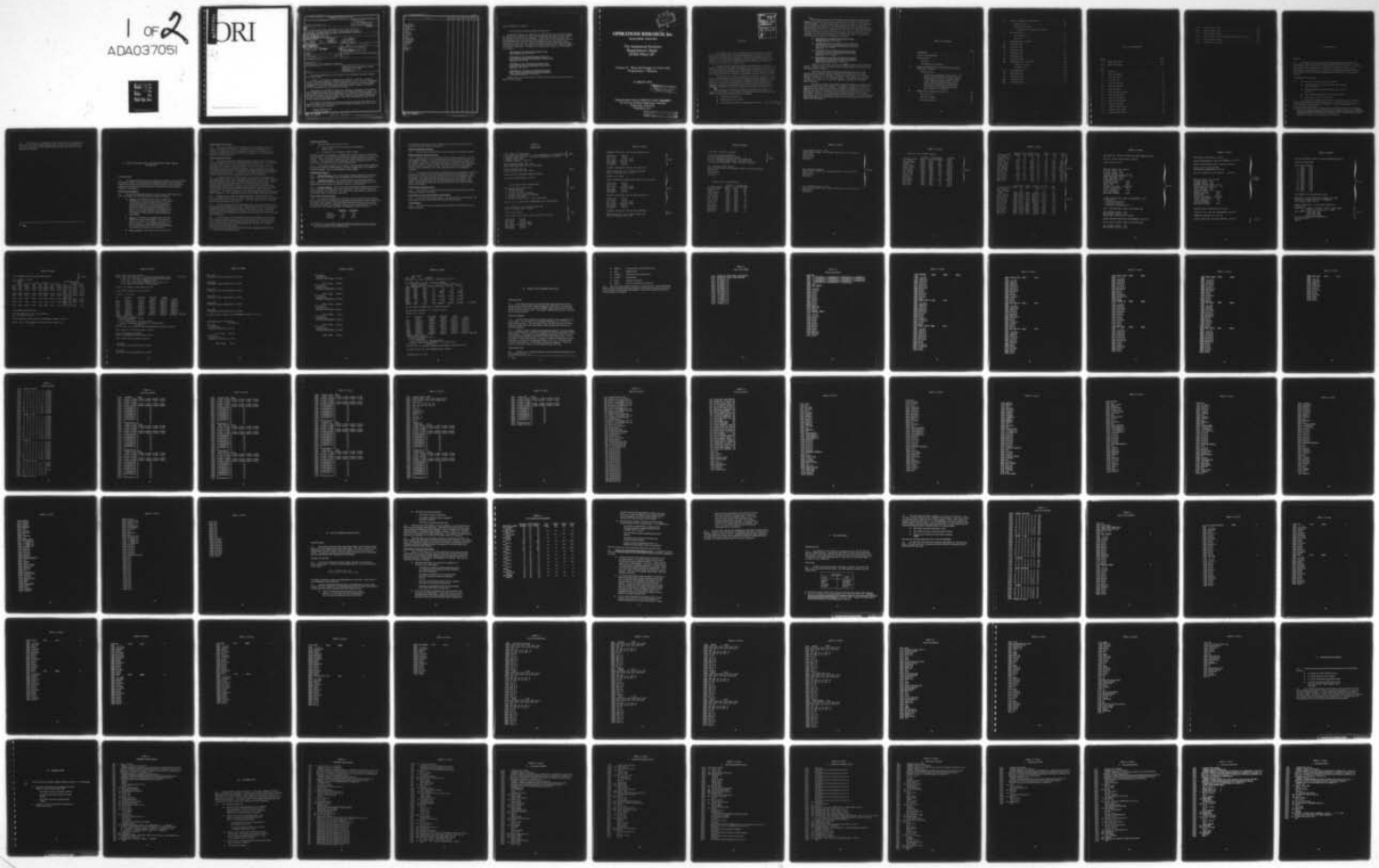

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13. ABSTRACT

This report summarizes the third phase of the Integrated Facilities Requirements Study (IFRS).

In Phase I, two analytic submodels were developed. The first, a Logistics Support Requirements Generator, estimates personnel, aircraft, and fuel requirements for each phase of undergraduate pilot training at the Naval Air Training Command (NATRACOM). The second, a Pacing Facilities Requirements submodel, calculates facility requirements for each phase of training.

The purpose of the Phase II study was to develop a preliminary total systems IFRS management planning tool (including the two submodels developed in Phase I, as well as Base Loading, Facilities Excess/Deficiency, and Total Cost submodels), and automate the model so that it provides quick, accurate, and relevant information for use in the decision-making process. This Static IFRS model has been in continuous operation since March 1970.

The purpose of the Phase III study was to refine the Static IFRS model and to expand the IFRS concept by developing three additional planning tools for use by Navy decision-makers as follows:

- Dynamic planning tool
- Optimization model

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|---|---|---|---|---|---|---|
| | ROLE | WT | ROLE | WT | ROLE | WT |
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| Requirements | | | | | | |
| Dynamic | | | | | | |
| Optimization | | | | | | |
| Fleet | | | | | | |
| Training | | | | | | |
| Aircraft | | | | | | |
| Pilot | | | | | | |
| Simulation | | | | | | |
| Programming | | | | | | |
| Management | | | | | | |
| Planning | | | | | | |
| Static | | | | | | |
| Air | | | | | | |
| Readiness | | | | | | |
| Model | | | | | | |

Item #13 (Abstract) continued

. Fleet Readiness Training Squadron planning tool.

The Dynamic planning tool simulates the undergraduate pilot training program on a weekly basis whereas the Static IFRS assumes an even annual flow of students. The Optimization model has two segments - a PTR Maximizer that calculates the maximum annual pilot training rate (PTR) possible for a given facilities inventory and a MCON Minimizer that calculates the minimum facility cost phase-to-base assignment for a desired PTR. The Fleet Readiness Training (FRT) model provides planning information for the readiness training squadrons and is designed similarly to the Static IFRS model. The Phase III documentation consists of the following four reports:

. The Integrated Facilities Requirements Study (IFRS) Phase III, ORI TR 645

. Development of the Automated Dynamic Model for the Integrated Facilities Requirements Study (IFRS) Phase III, ORI TR 646

. Development of the Optimization Model for the Integrated Facilities Requirements Study (IFRS) Phase III, ORI TR 647

. Development of the Fleet Air Readiness Training Model for the Integrated Facilities Requirements Study (IFRS) Phase III, ORI TR 648.

Changes made in the Static Phase II model during the Phase III study are documented in this volume.

# OPERATIONS RESEARCH, Inc.

SILVER SPRING, MARYLAND

# *The Integrated Facilities Requirements Study (IFRS) Phase III*

## Volume II - Phase III Changes to User's and Programmer's Manuals

31 March 1971



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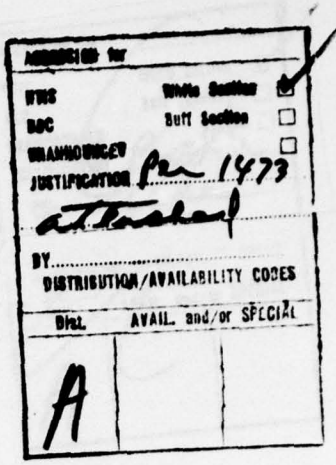


# FOREWORD

This report summarizes the third phase of the Integrated Facilities Requirements Study (IFRS). It has been prepared for the Systems Analysis Division of the Office of the Assistant Commander for Facilities Planning (Code 20), Naval Facilities Engineering Command (NAVFAC), Department of the Navy, as part of Contract N00025-67-C-0031 (NBy-78672) awarded to Operations Research, Inc., in June 1970.

In Phase I, two analytic submodels were developed. The first, a Logistics Support Requirements Generator, estimates personnel, aircraft, and fuel requirements for each phase of undergraduate pilot training at the Naval Air Training Command (NATRACOM). The second, a Pacing Facilities Requirements submodel, calculates facility requirements for each phase of training.

The purpose of the Phase II study was to develop a preliminary total systems IFRS management planning tool (including the two submodels developed in Phase I, as well as Base Loading, Facilities Excess/Deficiency, and Total Cost submodels), and automate the model so that it provides quick, accurate, and relevant information for use in the decision-making process. This Static IFRS model has been in continuous operation since March 1970.

The purpose of the Phase III study was to refine the Static IFRS model and to expand the IFRS concept by developing three additional planning tools for use by Navy decision-makers as follows:

- Dynamic planning tool;
- Optimization model; AND
- Fleet Readiness Training Squadron planning tool. NOT Base

The Dynamic planning tool simulates the undergraduate pilot training program on a weekly basis whereas the Static IFRS assumes an even annual flow of students. The Optimization model has two segments—a PTR Maximizer that calculates the maximum annual pilot training rate (PTR) possible for a given facilities inventory and a MCON Minimizer that calculates the minimum facility cost phase-to-base assignment for a desired PTR. The Fleet Readiness Training (FRT) model provides planning information for the readiness training squadrons and is designed similarly to the Static IFRS model. The Phase III documentation consists of the following four reports:

- The Integrated Facilities Requirements Study (IFRS) Phase III, ORI TR 645;
- Development of the Automated Dynamic Model for the Integrated Facilities Requirements Study (IFRS) Phase III, ORI TR 646;
- Development of the Optimization Model for the Integrated Facilities Requirements Study (IFRS) Phase III, ORI TR 647; AND
- Development of the Fleet Air Readiness Training Model for the Integrated Facilities Requirements Study (IFRS) Phase III, ORI TR 648.

Volume I of this report, TR 645, contains a summary of the three IFRS phases. Changes made in the Static Phase II model during the Phase III study are documented in Volume II.

These IFRS models were developed and programmed by the staff members of the Economic Analysis Division of Operations Research, Inc., under the direction of Dr. William J. Leininger, vice president and division director, and Thomas N. Kyle, program director. The project team members included R. J. Craig, M. C. Fisk, W. Liggett, F. McCoy, R. Messalle, and R. Yockman.

Mr. Dennis Whang of the Systems Analysis Division of Facilities Planning was contract monitor for NAVFAC. In addition, valuable assistance was provided by many other Navy personnel including, in particular, those in the Office of the Staff Civil Engineer and the Training/Plans Division of the Naval Air Training Command, the Aviation Training Division of the Chief of Naval Operations, and in the Systems Analysis Division of NAVFAC. The authors gratefully acknowledge the contributions made by all of these people to the development of the IFRS models.

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# I. INTRODUCTION

## PURPOSE

1.1 The purpose of this manual is to document the programming and data file changes made to the Static IFRS model under the Phase III contract. Several print changes and new features were suggested by users as well as by ORI. Primarily the requests were to shorten the running time by consolidating printouts and reducing data input requirements. Most of the desired changes were completed. Those changes requiring extensive programming changes were not completed at this time.

## ORGANIZATION OF MANUAL

1.2 This manual is divided into several sections:

- A sample run of the new Static IFRS model showing the new features
- Current pilot training planning factor data files for 1970-1971
- The NFO training pipeline and related data files
- Programming changes and listings.

1.3 Even though the sample run in the next section of this manual provides a quick introduction to the Static IFRS model, it is assumed that the user is familiar with the previous version of IFRS (i.e., Phase II model) and its user's and programmer's manuals.[1/]

1/ The Phase II Static IFRS is documented in ORI Technical Report 583, Development of a Preliminary Automated Total Systems Model for the Integrated Facilities Requirements Study (IFRS) Phase II, 9 February 1970. Volume III is the User's Manual and Volume IV is the Programmer's Manual.

1.4 This manual is a supplement to the previous user's and programmer's manual.[2/] It is not intended to replace them. To get the most utility from this manual the reader should familiarize himself with and refer to the other manuals as necessary.

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2/ Ibid.

## II. STATIC IFRS SAMPLE RUN ILLUSTRATING NEW PRINT CHANGES OF PHASE III

### INTRODUCTION

2.1 The purpose of this section is to discuss the present Static IFRS sample run shown in Table 2.1 (at the end of this section) and point out the features added to the Phase II IFRS model under the Phase III study. The parenthetical numbers on the right-hand side of this table correspond with the paragraph numbers in this section.

LSR Level of Complexity

2.2 The level of complexity question and the results of the options are new. The results of the various options are listed as follows:

- Level 1. This option asks the user a limited set of questions in the LSR module section of the model and therefore provides a limited set of printouts. Its primary purpose is to let the experienced user rapidly calculate the resource requirements for a given PTR. The main reduction in printouts occurs because the student statistics are not printed for each pipeline. Also the user cannot constrain the LSR results.
- Level 2. This option is designed for the user who needs more detail and flexibility. The printouts and set of questions and options are similar to the level of Phase II. Level 2 differs from level 1 in that more questions are asked and printouts offered. The sample run in Table 2.1 is for level 2.
- Levels 3 and 4. These are the same as in IFRS II.

Select Pilot or NFO Option

2.3 The user has the option to indicate to the model whether or not the pilot or NFO training system (i.e., data files) is to be considered in his analysis. A discussion of the NFO options is contained in Section IV of this manual. Essentially all the features of the LSR module are the same for the pilot and the NFO system.[1/]

Simple Constraint Feature

2.4 The simple constraint calculation feature allows the user rapid access to student output and resource requirements within a given phase. By entering any one of student output, number of aircraft, annual flight hours, aircraft operating cost, number of flight instructors, or number of enlisted men, the related five values are calculated and printed. These calculations are based on only the first aircraft type. This provides management with planning information for each training phase. In Table 2.1, the sample response is yes (a no response takes the user to the pipeline section of the LSR module).

2.5 To illustrate the use of this feature, assume the user initially wants to consider phase 7 which has an assumed cost per flight hour of $200. The user first enters this data as 7,200. The model then prints the phase name. Next, the user enters the constraint option, that is the item number (reference number) of the planning factor. In this case the user wants to determine the student output based on the availability of 100 aircraft. Since the item number is 2 for the number of aircraft and he has 100 aircraft, he enters 2,100 to indicate this. The model then prints out the maximum student output and the other related resources. For instructors the value also includes those under training.

2.6 Assume there are only 100 flight instructors available for the same phase, therefore the user enters 5, 100 (5 is the item number for flight instructors). The model prints out the other five values. Next the user enters 0,0 to indicate no further calculations for this phase.

2.7 The user next enters 8,175 indicating phase 8 is to be considered and its assumed cost per flight hour is $175. Then the user wants to see the resource requirements for 200 graduating students and thus enters 1,200. The related resource requirements are printed as shown. The user then wants to see how many students can be supported by 90 aircraft and he enters 2,90 and the 6 values are again printed.

2.8 The user enters 0,0 to indicate no further calculations for this phase. Then, when the program requests a new phase and cost, the user again enters a 0,0 to indicate he is finished with the simple constraints. At this point the user can hit the BREAK key to stop the program and sign off or can continue into the normal LSR module setup.

---

1/ A new feature necessitated by the NFOs is that a pipeline now can have a maximum of six following phases.

Pipeline Instructions

2.9 This instruction tells the user how to

- Print or skip the student statistics for a (pipeline) student source.
- Completely skip a (pipeline) student source.

Instead of using 0,0 to indicate no further data, now the user can also indicate his print option. Note that this instruction only partially applies to level of complexity 1, since the student statistics for each student type are never printed in level 1. This instruction is not printed for level of complexity number 1. The results of a 0,0 entry are shown in the sample printout.

2.10 This printout shows the use of the 0,1 indicator option which suppresses the student summary by student types. For the 0,2 option the 0,2 is typed as the first response. This is not illustrated in this sample.

LSR Summary Printouts

2.11 Student Summary. This is the student summary printout for all student types. Note that the student load now appears with the other student data.

2.12 Manpower Summary. This printout contains the required instructor, officer and enlisted men for all students sources. Academic instructors are no longer printed even though the equations are still in the model.2/

2.13 Aircraft Summary. This is the aircraft information provided for each phase. Note that gallons and flight hours are in thousands. Also the MO factor is the factor contained in the data file. The number of aircraft required is printed to one decimal place as requested by the user.

Phase II LSR Constraint Option

2.14 The option to constrain the LSR output has been corrected and modified. Now the user can run a sequence of constraints and find which is most constraining, then print a new summary. Note that these constrained values are not used in the runway and airspace calculations unless the new constrained PTR is entered into the LSR. The sample illustrates the following example for phase 7.

| | Required | Constraint |
|---|---|---|
| Aircraft | 153 | 140 |
| Instructors | 150 | 130 |
| Enlisted | 1,128 | 1,000 |

2/ By making a minor change in program LSR3, the academic instructor information can be printed in the aircraft section.

The model then indicates that the instructors are the constraint and the final summary shows the related requirements.

Runway and Airspace Printout

2.15 The user now has the option to skip the runway and airspace printout.

Standard Phase-to-Base Assignment

2.16 The user can now use a standard phase-to-base assignment. This is a very flexible feature. The standard phase-to-base allocation is stored in the file PHABA*. The user can type out the new file on paper tape and store it in the machine before he runs the Static IFRS model. Note that if the model finds an error in any line of data in the file, that line will not be printed or used. The error will be indicated later, since the phase will not be completely assigned.

2.17 If the user wants to change a few phase-to-base assignments, he has an an option to correct or modify the standard phase-to-base assignment. However, when a new phase-to-base assignment is made, the old assignment must be deleted. The model will detect the error later if it is not deleted. The sample shows changing phase 2 from NAS Pensacola to NAS Corpus Christi. (Note: This on-line change does not permanently affect the standard assignment in file PHABA*.)

Detailed Base Loading Printout

2.18 The question to skip the detailed base loading data printout has been changed to require a yes answer.

Print Level 1 for New Total Systems Cost Printout

2.19 For level of print detail number 1, the user now gets the operations and maintenance (O&M) cost summary with the total system costs.

Cost Subtotals

2.20 The O&M cost as well as aircraft investment cost subtotals are now printed as shown.

TABLE 2.1

SAMPLE RUN

```
ENTER LEVEL OF COMPLEXITY
1 LIMITED DATA INPUT/OUTPUT - NO ADJUSTMENTS OR MODIFICATIONS
2 DETAILED INPUT/OUTPUT - OPTION TO CONSTRAIN LSR OUTPUT
3 MODIFY PHASE DATA
4 COMBINE OPTIONS 2 AND 3?2                                          (2.2)

ENTER TRAINING WEEKS PER YEAR
AND ANNUAL FLY-DAYS (XX.,XXX.)?50,245

ENTER TRAINING FLOW NO.
1 FOR PILOT, 2 FOR NFO. (X)?1                                        (2.3)

PRINT LIST OF TRAINING PHASES (Y,N)?N

TRY SIMPLE CONSTRAINTS (Y,N)?Y

    SIMPLE CONSTRAINT CALCULATIONS

THE CONSTRAINT OPTIONS ARE:
 1  STUDENT OUTPUT
 2  NO. OF AIRCRAFT
 3  FLIGHT HRS (IN THOUSANDS)
 4  COST(IN THOUSANDS) FOR FLYING                                     (2.4)
 5  FLIGHT INSTRUCTORS
 6  ENLIST. MAINT.(M.O. X NUMB. AIRCRAFT)

ENTER 0,0 FOR NO FURTHER CONSTRAINTS OR CALCULATIONS

ENTER PHASE NO. TO BE CONSTRAINED AND
COST PER FLIGHT HOUR ?7,200

PHASE: ADV JET-TF                                                    (2.5)

ENTER CONSTRAINT OPTION AND VALUE(X,XXX.)?2,100

STUDS OUT      293.21
A/C REQED      100.00
FLT. HRS.       60.11 X1000
FLT. COST    12021.66 X1000
FLT.INSTR      110.11
ENL.MAINT      735.00
```

TABLE 2.1 (Cont)

```
ANOTHER CONSTRAINT OPTION AND VALUE?5,100

STUDS OUT      266.28
A/C REQED       90.81
FLT. HRS.       54.59 X1000
FLT. COST    10917.46 X1000
FLT.INSTR      100.00
ENL.MAINT      667.49

ANOTHER CONSTRAINT OPTION AND VALUE?0,0

ENTER PHASE NO. TO BE CONSTRAINED AND
COST PER FLIGHT HOUR ?8,175

PHASE: ADV JET-TA

ENTER CONSTRAINT OPTION AND VALUE(X,XXX.)?1,200

STUDS OUT      200.00
A/C REQED       60.02
FLT. HRS.       39.00 X1000
FLT. COST     6825.00 X1000
FLT.INSTR       71.51
ENL.MAINT      450.18

ANOTHER CONSTRAINT OPTION AND VALUE?2,90

STUDS OUT      299.88
A/C REQED       90.00
FLT. HRS.       58.48 X1000
FLT. COST    10233.41 X1000
FLT.INSTR      107.23
ENL.MAINT      675.00

ANOTHER CONSTRAINT OPTION AND VALUE?0,0

ENTER PHASE NO. TO BE CONSTRAINED AND
COST PER FLIGHT HOUR ?0,0
```

(2.6)

(2.7)

(2.8)

TABLE 2.1 (Cont)

```
PRINT ALL PIPELINES (Y,N)?N

FOR THE TRAINING PIPELINES
AFTER ENTERING THE DATA - ENTER
0,0 FOR PIPELINE COMPUTATION AND PRINT OUT
0,1 FOR PIPELINE COMPUTATION - NO PRINT OUT
0,2 FOR NO COMPUTATION - SKIP TO NEXT PIPELINE

FOR PIPELINE: NAVY OFFICER
ENTER PHASE NUMBER AND STUDENT OUTPUT (XX,XXXX.)?7,180
NEXT?8,220
NEXT?11,225
NEXT?15,200
NEXT?0,0
```

(2.9)

STUDENT TYPE: NAVY OFFICER

| | .STUDENT | STATISTICS. | |
|---|---|---|---|
| TRAINING PHASE | INPUT | OUTPUT | ATTRITES |
| ENVIRO INDOC | 1033. | 1002. | 31. |
| PRIMARY | 1002. | 962. | 40. |
| BASIC JET-A | 457. | 429. | 27. |
| BASIC JET-B | 429. | 417. | 13. |
| B-JET G/CO | 417. | 412. | 4. |
| ADV JET-TF | 186. | 180. | 6. |
| ADV JET-TA | 227. | 220. | 7. |
| BASIC PROP | 269. | 228. | 40. |
| B-PROP CO | 228. | 227. | 1. |
| ADV PROP | 227. | 225. | 2. |
| BASIC HELO | 236. | 203. | 33. |
| PRE HELO | 203. | 202. | 1. |
| HELO PRIM | 202. | 201. | 1. |
| HELO ADV | 201. | 200. | 1. |

TABLE 2.1 (Cont)

```
FOR PIPELINE: NAVY - AOC
ENTER PHASE NUMBER AND STUDENT OUTPUT (XX,XXXX.)?7,180
NEXT?8,220
NEXT?11,225
NEXT?15,200
NEXT?0,1

FOR PIPELINE: MARINE
ENTER PHASE NUMBER AND STUDENT OUTPUT (XX,XXXX.)?7,90
NEXT?8,110
NEXT?15,300
NEXT?0,1

FOR PIPELINE: C-GRD & FOR.
ENTER PHASE NUMBER AND STUDENT OUTPUT (XX,XXXX.)?11,100
NEXT?15,50
NEXT?0,1
```

(2.10)

TABLE 2.1 (Cont)

TOTAL FOR ALL STUDENT TYPES

| TRAINING PHASE | •STUDENT STATISTICS• INPUT | OUTPUT | ATTRITES | STUDENT LOAD |
|---|---|---|---|---|
| AOC SCHOOL | 1285. | 1183. | 103. | 246.8 |
| ENVIRO INDOC | 1807. | 1763. | 43. | 178.5 |
| PRIMARY | 2946. | 2708. | 238. | 339.3 |
| BASIC JET-A | 1152. | 1078. | 74. | 267.6 |
| BASIC JET-B | 1078. | 1050. | 28. | 170.2 |
| B-JET G/CQ | 1050. | 1035. | 15. | 125.1 |
| ADV JET-TF | 466. | 450. | 16. | 183.2 |
| ADV JET-TA | 569. | 550. | 19. | 223.9 |
| BASIC PROP | 675. | 560. | 115. | 234.7 |
| B-PROP CQ | 460. | 457. | 3. | 36.7 |
| ADV PROP | 557. | 550. | 7. | 188.2 |
| BASIC HELO | 881. | 761. | 120. | 295.5 |
| PRE HELO | 761. | 757. | 4. | 75.9 |
| HELO PRIM | 757. | 754. | 4. | 60.4 |
| HELO ADV | 754. | 750. | 4. | 120.3 |

(2.11)

TABLE 2.1 (Cont)

| TRAINING PHASE | *FLIGHT EFFECT | INSTRUCTORS* IUT | TOTAL | LSO REQMT | ADMIN OFF | TOTAL OFF | TOTAL ENL |
|---|---|---|---|---|---|---|---|
| AOC SCHOOL | 0. | 0. | 0. | 0. | 7. | 7. | 0. |
| ENVIRO INDOC | 0. | 0. | 0. | 0. | 5. | 5. | 0. |
| PRIMARY | 137. | 11. | 149. | 0. | 21. | 170. | 322. |
| BASIC JET-A | 129. | 11. | 139. | 0. | 25. | 164. | 604. |
| BASIC JET-B | 102. | 8. | 110. | 0. | 26. | 136. | 816. |
| B-JET G/CO | 45. | 4. | 49. | 8. | 19. | 76. | 507. |
| ADV JET-TF | 150. | 19. | 169. | 0. | 32. | 201. | 1241. |
| ADV JET-TA | 175. | 22. | 197. | 0. | 34. | 230. | 1362. |
| BASIC PROP | 94. | 8. | 102. | 0. | 21. | 123. | 481. |
| B-PROP CO | 6. | 1. | 7. | 4. | 4. | 14. | 74. |
| ADV PROP | 103. | 13. | 116. | 0. | 27. | 143. | 845. |
| BASIC HELO | 123. | 10. | 133. | 0. | 26. | 159. | 628. |
| PRE HELO | 27. | 2. | 29. | 0. | 7. | 36. | 129. |
| HELO PRIM | 30. | 3. | 33. | 0. | 6. | 39. | 97. |
| HELO ADV | 76. | 6. | 83. | 0. | 19. | 101. | 449. |

(2.12)

| TRAINING PHASE | * AIRCRAFT* TYPE | NO. | FUEL TYPE | GALLONS - - (000)- | ANN/HRS - - - | MO FACT. |
|---|---|---|---|---|---|---|
| AOC SCHOOL | | 0. | | 0. | 0. | 0. |
| ENVIRO INDOC | | 0. | | 0. | 0. | 0. |
| PRIMARY | T34B | 109.7 | AGAS | 1112.4 | 88.3 | 2.6 |
| BASIC JET-A | T-2A | 100.5 | JP-4 | 21827.5 | 70.2 | 5.5 |
| BASIC JET-B | T2BC | 103.6 | JP-4 | 24680.7 | 67.6 | 7.2 |
| B-JET G/CO | T2BC | 59.4 | JP-4 | 11600.2 | 31.8 | 7.8 |
| ADV JET-TF | TF9J | 153.5 | JP-4 | 53043.7 | 92.2 | 7.4 |
| ADV JET-TA | TA4J | 165.1 | JP-4 | 50407.5 | 107.2 | 7.5 |
| BASIC PROP | T28C | 101.3 | AGAS | 3607.8 | 71.4 | 4.3 |
| B-PROP CO | T28C | 11.3 | AGAS | 346.1 | 6.9 | 5.5 |
| ADV PROP | TS2A | 86.4 | AGAS | 6577.5 | 68.1 | 8.9 |
| BASIC HELO | T28C | 132.1 | AGAS | 4705.3 | 93.2 | 4.3 |
| PRE HELO | T28C | 22.4 | AGAS | 898.4 | 17.8 | 4.8 |
| HELO PRIM | TH57 | 26.9 | AGAS | 229.8 | 18.2 | 3.0 |
| HELO ADV | TH1L | 67.8 | JP-4 | 4275.0 | 42.7 | 6.0 |

(2.13)

TABLE 2.1 (Cont)

```
DETAILED LSR OUTPUT DESIRED FOR ALL PHASES(Y,N)?N

ANY LSR OUTPUT CONSTRAINTS (Y,N)?Y

WHICH PHASE (XX)?7


NAME OF PHASE: ADV JET-TF
STUDENT INPUT  466.
STUDENT OUTPUT  450.
AVERAGE STUDENT LOAD  183.2
ADMINISTRATIVE OFFICERS   32.
TOTAL OFFICERS  201.
TOTAL ENLISTED 1241.
AIRCRAFT TYPES          TF9J
NUMBER REQUIRED          153.
FUEL TYPES               JP-4
GALLONS CONSUMED    0.530E+08
FLIGHT INSTRUCTORS       150.
UNDER TRAINING            19.
LSO REQUIREMENTS           0.
ENLISTED SUPPORT        1128.


SELECT APPROPRIATE FIELD AND ELEMENT (X,X)
 1 AIRCRAFT
 2 FLIGHT INSTRUCTORS
 3 ENLISTED SUPPORT
 4 ACADEMIC INSTRUCTORS?1,1

ENTER CONSTRAINING VALUE (XXXX.XXX)?140

OLD STUDENT OUTPUT  450.
CONSTRAINED OUTPUT  410.
ADDITIONAL CONSTRAINTS (Y,N)?Y

SELECT APPROPRIATE FIELD AND ELEMENT (X,X)?2,1

ENTER CONSTRAINING VALUE (XXXX.XXX)?130

OLD STUDENT OUTPUT  410.
CONSTRAINED OUTPUT  346.
```

(2.14)

TABLE 2.1 (Cont)

```
ADDITIONAL CONSTRAINTS (Y,N)?Y

SELECT APPROPRIATE FIELD AND ELEMENT (X,X)?3,1

ENTER CONSTRAINING VALUE (XXXX.XXX)?1000

VALUE IS NOT CONSTRAINING
ADDITIONAL CONSTRAINTS (Y,N)?N

NEW LSR SUMMARY FOR ADV JET-TF   (Y,N)?Y


NAME OF PHASE: ADV JET-TF
STUDENT INPUT  358.
STUDENT OUTPUT  346.
AVERAGE STUDENT LOAD  140.9
ADMINISTRATIVE OFFICERS   28.
TOTAL OFFICERS  158.
TOTAL ENLISTED  955.
AIRCRAFT TYPES          TF9J
NUMBER REQUIRED         118.
FUEL TYPES              JP-4
GALLONS CONSUMED   0.408E+08
FLIGHT INSTRUCTORS      116.
UNDER TRAINING           14.
LSO REQUIREMENTS          0.
ENLISTED SUPPORT        868.


ANOTHER PHASE CONSTRAINED (Y,N)?N

REVISE LSR TO INCLUDE CONSTRAINTS (Y,N)?N

GENERATE ANOTHER LSR (Y,N)?N

PRINT RUNWAY AND AIRSPACE FACTORS (Y,N)?N
```

(2.14) (Cont)

(2.15)

TABLE 2.1 (Cont)

```
USE THE STANDARD PHASE TO BASE ALLOCATION(Y,N)?Y

STANDARD ALLOCATION

PHASE BASE PERCENT
   1  PENS     1.00
   2  PENS     1.00
   3  SAUF     1.00
   4  MERI     1.00
   5  MERI     1.00
   6  PENS     1.00
   7  CHAS     1.00
   8  KING     1.00
   9  WHIT     1.00
  10  SAUF     1.00
  11  CORP     1.00
  12  WHIT     1.00
  13  PENS     1.00
  14  ELLY     1.00
  15  ELLY     1.00

ANY CHANGES OR CORRECTIONS(Y,N)?Y

*CAUTION: IF YOU REASSIGN A PHASE, YOU MUST
*DELETE OR CHANGE THE OLD ASSIGNMENT.
*(TO DELETE ENTER 0.0%)

PHASE ALLOCATION:  ASSIGN EACH PHASE AS--
II,AAAA,.XX
WHERE: II = PHASE (2 DIGITS); AAAA = BASE CODE;
       .XX = PERCENT AT BASE (1.0 = 100%)
BASE CODES: CHAS CORP ELLY
            KING MERI PENS
            SAUF WHIT PHAN
II = 0 TO TERMINATE:?02,PENS,0.0
NEXT?02,CORP,1.
NEXT?0
```

(2.16)

(2.17)

TABLE 2.1 (Cont)

SKIP DETAILED BASE LOADING DATA(Y,N)?Y } (2.18)

BASE LOADING SUMMARY

| *PERSONNEL | | | | | | | | *AIRCRAFT | | *FUEL | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | STD. | ----------BASE TOTALS ---------- | | | | | | | | MILLION GAL. | |
| NAS | LOAD | PHASE | NAS | OFF | ENL | CIV | TOTAL | TYPE | NO. | TYPE | AMOUNT |
| CHAS | 183. | 1625. | 939. | 256. | 1801. | 324. | 2564. | TF9J | 153. | JP-4 | 53.04 |
| COFP | 367. | 1360. | 2352. | 475. | 2807. | 5784. | 9433. | TS2A | 86. | AGAS | 6.58 |
| ELLY | 181. | 866. | 743. | 184. | 1035. | 210. | 1609. | TH57 | 27. | AGAS | 0.23 |
| | | | | | | | | TH1L | 68. | JP-4 | 4.27 |
| KING | 224. | 1816. | 989. | 290. | 1940. | 350. | 2805. | TA4J | 165. | JP-4 | 50.41 |
| MERI | 438. | 2158. | 1081. | 379. | 2041. | 396. | 3254. | T-2A | 101. | JP-4 | 46.51 |
| | | | | | | | | T2BC | 104. | | |
| PENS | 448. | 1204. | 2825. | 783. | 2835. | 7667. | 11733. | T2BC | 59. | JP-4 | 11.60 |
| | | | | | | | | T28C | 22. | AGAS | 0.90 |
| SAUF | 376. | 956. | 766. | 236. | 894. | 217. | 1722. | T34B | 110. | AGAS | 1.46 |
| | | | | | | | | T28C | 11. | | |
| WHIT | 530. | 1921. | 1027. | 353. | 1727. | 382. | 2993. | T28C | 233. | AGAS | 8.31 |

REALLOCATE PHASES(Y,N)?N

AIRSPACE FACTORS & OLF REQUIREMENTS:
SKIP PRINTOUT (Y,N)?Y

DO YOU WANT TO SKIP RUNWAY REQUIREMENTS OUTPUT (Y,N)?Y

TOTAL RUNWAY INVESTMENT FOR CURRENT YEAR (THOUS.):
0.

TABLE 2.1 (Cont)

```
WHICH LEVEL OF PRINT DETAIL
TYPE 1 FOR O&M COST SUM. & TOTAL SYSTEM COST(TSC) ONLY                    } (2.19)
     2 FOR TSC & DETAILED FACILITIES EXCESS-DEFICIENCY
     3 FOR TSC & NAS COST SUMMARIES ONLY
     4 FOR TSC & FACILITIES DEFICITS & NAS COST SUM.
     5 FOR CHOICE OF DETAILS (IF DESIRED)?1

ACCEPT SUBSTANDARD FACILITIES (Y,N)?Y

SAME OPTION FOR ALL BASES (Y,N)?Y

SUMMARY O & M COST

NAS      MILITARY      A/C FUEL     A/C O&M       BASE
           P&A           TOTAL        TOTAL      SUPPORT      TOTAL
CHAS      16006.3       6804.1       2388.4       3563.5     28762.3
CORP      21632.3       1626.4       1013.9      11344.4     35616.9
ELLY      10393.2        643.2        469.7       2481.7     13987.7
KING      17695.8       6469.3       4041.2       3835.9     32042.2
MERI      21415.5       5974.1       2029.5       4345.1     33764.2
PENS      26863.8       2555.1        627.5      13948.9     43995.4
SAUF      12011.1        309.1        266.5       2609.6     15196.4
WHIT      19854.6       1443.8       1903.0       4048.8     27250.2
TOTAL    145872.6      25825.2      12739.6      46177.8    230615.2   } (2.20)
TOTAL SYSTEMS COST =
  FACILITY INVESTMENT COSTS
  + A/C INVESTMENT
  + O & M COSTS (LESS NON ADD ITEMS)
  + CNATRA, CNABATRA, CNAVANTRA --- FIXED COSTS
---------          420237.2
DO YOU WISH TO RETURN TO EXCESS-DEFICIENCY PROGRAM (Y,N)?Y

TYPE LEVEL OF PRINTING DETAIL (1-5)?5

EXCESS DEFICIENCY PROGRAM
ACCEPT SUBSTANDARD FACILITIES (Y,N)?Y

SAME OPTION FOR ALL BASES (Y,N)?Y


NAS--CHAS
 DETAILED EXCESS-DEFICIENCY (Y,N)?N


NAS--CORP
 DETAILED EXCESS-DEFICIENCY (Y,N)?N
```

TABLE 2.1 (Cont)

```
NAS--ELLY
 DETAILED EXCESS-DEFICIENCY (Y,N)?N


NAS--KING
 DETAILED EXCESS-DEFICIENCY (Y,N)?N


NAS--MERI
 DETAILED EXCESS-DEFICIENCY (Y,N)?N


NAS--PENS
 DETAILED EXCESS-DEFICIENCY (Y,N)?N


NAS--SAUF
 DETAILED EXCESS-DEFICIENCY (Y,N)?N


NAS--WHIT
 DETAILED EXCESS-DEFICIENCY (Y,N)?N

DO YOU WISH TO MODIFY THE SUBSTANDARD OPTION (Y,N) ?N


INVESTMENT COST (THOUSANDS
                      OF DOLLARS)
NAS--CHAS
  FACILITIES
 DETAILED BREAKDOWN (Y,N)?N


        BASE TOTAL    2742.1
NAS--COFP
  FACILITIES
 DETAILED BREAKDOWN (Y,N)?N


        BASE TOTAL     125.1
```

TABLE 2.1 (Cont)

```
NAS--ELLY
  FACILITIES
 DETAILED BREAKDOWN (Y,N)?N


        BASE TOTAL   3202.4
NAS--KING
  FACILITIES
 DETAILED BREAKDOWN (Y,N)?N


        BASE TOTAL   1870.0
NAS--MERI
  FACILITIES
 DETAILED BREAKDOWN (Y,N)?N


        BASE TOTAL  13636.1
NAS--PENS
  FACILITIES
 DETAILED BREAKDOWN (Y,N)?N


        BASE TOTAL    175.0
NAS--SAUF
  FACILITIES
 DETAILED BREAKDOWN (Y,N)?N


        BASE TOTAL   2572.5
NAS--WHIT
  FACILITIES
 DETAILED BREAKDOWN (Y,N)?N


        BASE TOTAL   1946.5
```

TABLE 2.1 (Cont)

```
       NAS TOTAL
YEAR 1970           26269.8
DETAILED A/C ASSET POSITION & INVESTMENT (Y,N)?Y

A/C INVESTMENT & ASSET POSITION---CNATRA
      ASSET  POSITION          ------ COSTS (THOUS.) ----
 A/C AVAILABLE REQ'D  DEFICIT FLYAWAY  SUPPORT   TOTAL
T34B     150.    126.      0.      0.      0.      0.
T28C     469.    307.      0.      0.      0.      0.
T-2A     114.    116.      2.    963.    144.    1107.
T2BC     178.    188.     10.   5708.    856.    6565.
TF9J     399.    176.      0.      0.      0.      0.
TA4J     100.    190.     90.  98808.  14821.  113630.
TS2A     179.     99.      0.      0.      0.      0.
TH1L       0.     78.     78.  31174.   4676.   35851.
TH57      34.     31.      0.      0.      0.      0.
TOTAL   1709.   1311.    179. 136654.  20498.  157152.     } (2.20)

DO YOU WISH TO CONSTRAIN LSR OUTPUT (Y,N)?N

DO YOU WANT DETAILED O & M COSTS (Y,N)?N

SUMMARY O & M COST

NAS      MILITARY      A/C FUEL     A/C O&M       BASE
           P&A           TOTAL        TOTAL     SUPPORT      TOTAL
CHAS     16006.3       6804.1       2388.4      3563.5     28762.3
COFP     21632.3       1626.4       1013.9     11344.4     35616.9
ELLY     10393.2        643.2        469.7      2481.7     13987.7
KING     17695.8       6469.3       4041.2      3835.9     32042.2
MERI     21415.5       5974.1       2029.5      4345.1     33764.2
PENS     26863.8       2555.1        627.5     13948.9     43995.4
SAUF     12011.1        309.1        266.5      2609.6     15196.4
WHIT     19854.6       1443.8       1903.0      4048.8     27250.2
TOTAL   145872.6      25825.2      12739.6     46177.8    230615.2 } (2.20)
TOTAL SYSTEMS COST =
  FACILITY INVESTMENT COSTS
  + A/C INVESTMENT
  + O & M COSTS (LESS NON ADD ITEMS)
  + CNATRA, CNABATRA, CNAVANTRA --- FIXED COSTS
---------          420237.2
DO YOU WISH TO RETURN TO EXCESS-DEFICIENCY PROGRAM (Y,N)?N

DO YOU WISH TO RUN FOR ANOTHER YEAR (Y,N)?N


PROGRAM STOP AT 3549
```

# III. CURRENT PILOT TRAINING DATA FILES

## INTRODUCTION

3.1 This section merely lists the data files which contain the current planning factors for the pilot training system for 1970-1971. The only completely new data file in this section is PHABA* which includes the standard phase-to-base allocation data. The reader is referred to the IFRS II manual[1/] for the other data files.

## DATA FILE—PHABA*

3.2 This data file contains the standard phase-to-base assignment used by the model. It can contain any assignment schedule, i.e., it can be a proposed assignment. With this idea in mind, the first two lines of the data file are not read, so the user can insert a title on these lines for his own reference purposes.

3.3 Table 3.1 gives a listing of this present data file. The only requirement for this data file is that all line numbers must contain four digits followed by two blanks. The phase-to-base assignment has the same format that the user follows when entering data while the Static IFRS model is run. That is, two digits for each phase number, a comma, a valid base abbreviation of four characters, a comma and a percentage (100% = 1.0), i.e., a decimal point and two or three places. No end-of-file indicator is required. If there is an error in any line of data, the model does not print that line.

## OTHER DATA FILES

3.4 Tables 3.2-3.7 contain listings of the other related data files for the pilot training system, i.e.,

---

1/ Ibid.

- BASCAS - training phase planning factor data
- PIPE - pipeline data
- RUNDAT - additional phase runway data
- ACDAT* - aircraft data
- RPIFI* - facilities inventory
- INVOC - facility investment cost factors.

3.5 The only major change in format is in the PIPE file. This was modified when the NFO training system was included. Previously each phase could have only a maximum of three following phases. Now it has a maximum of six and so more zeroes are required.

TABLE 3.1

DATA FILE PHABA*

```
1000  STANDARD PHASE-BASE ALLOCATION
1005  PHASE NO.,BASE CODE,PERCENT
1010  01,PENS,1.0
1015  02,PENS,1.0
1020  03,SAUF,1.0
1025  04,MERI,1.0
1030  05,MERI,1.0
1035  06,PENS,1.0
1040  07,CHAS,1.0
1045  08,KING,1.0
1050  09,WHIT,1.0
1055  10,SAUF,1.0
1060  11,CORP,1.0
1065  12,WHIT,1.0
1070  13,PENS,1.0
1075  14,ELLY,1.0
1080  15,ELLY,1.0
```

TABLE 3.2

DATA FILE BASCAS

```
1000 NY,
1005  0.100000E+01 0.156000E+03 0.480000E+02 0.100000E+01
1010  0.101000E+04 0.100000E+04 0.100000E+04 0.100000E+04
1015  0.100000E+04 0.101500E+04 0.100000E+04 0.480000E+02
1020  0.500000E+02 0.500000E+02 0.102000E+04
1025  15
1030 AOC SCHOOL
1035    0  0
1040 .5,10,0
1045 1.0,0,0
1050 0,0,0
1055 5,0,0
1060 0,0,0
1065 0,0,0
1070 50,0,0
1075 0,0,0
1080 0,0,0
1085 0,0,0
1090 489,0,0
1095 700,0,0
1100 3,0,0
1105 ENVIRO INDOC
1110    0  0
1115 .5,5,0
1120 1.0,0,0
1125 0,0,0
1130 5,0,0
1135 0,0,0
1140 0,0,0
1145 50,0,0
1150 0,0,0
1155 0,0,0
1160 0,0,0
1165 200,0,0
1170 700,0,0
1175 3,0,0
```

TABLE 3.2 (Cont)

```
1180 PRIMARY      T34B          AGAS          ACAD
1185    1  0
1190 .5,6,24
1195 .782,0,0
1200 12.6,0,0
1205 4.2,0,0
1210 3.01,0,0
1215 32.6,0,0
1220 29.2,0,0
1225 2,0,0
1230 0,0,0
1235 2.55,0,0
1240 50,0,0
1245 700,0,0
1250 3,0,0
1255 BASIC JET-A T-2A         JP-4
1260    1  0
1265 .5,12,24
1270 .805,0,0
1275 311,0,0
1280 3.54,0,0
1285 2.85,0,0
1290 65.1,0,0
1295 67,0,0
1300 2,0,0
1305 0,0,0
1310 5.46,0,0
1315 71.25,0,0
1320 0,0,0
1325 0,0,0
1330 BASIC JET-B T2BC         JP-4
1335    1  0
1340 .5,8,24
1345 .795,0,0
1350 365,0,0
1355 3.35,0,0
1360 2.85,0,0
1365 64.4,0,0
1370 53.7,0,0
1375 2,0,0
1380 0,0,0
1385 7.16,0,0
1390 71.25,0,0
1395 0,0,0
1400 0,0,0
```

TABLE 3.2 (Cont)

```
1405 B-JET G/CQ  T2BC          JP-4
1410    1  0
1415 .5,6,24
1420 .83,0,0
1425 365,0,0
1430 2.63,0,0
1435 2.36,0,0
1440 30.7,0,0
1445 20.9,0,0
1450 2,0,0
1455 15,0,0
1460 7.76,0,0
1465 0,0,0
1470 0,0,0
1475 0,0,0
1480 ADV JET-TF  TF9J          JP-4
1485    1  0
1490 .5,20,24
1495 .846,0,0
1500 575,0,0
1505 2.9,0,0
1510 2.1,0,0
1515 205,0,0
1520 145.3,0,0
1525 3,0,0
1530 0,0,0
1535 7.35,0,0
1540 93,0,0
1545 0,0,0
1550 0,0,0
1555 ADV JET-TA  TA4J          JP-4
1560    1  0
1565 .5,20,24
1570 .85,0,0
1575 470,0,0
1580 3.12,0,0
1585 2.1,0,0
1590 195,0,0
1595 139,0,0
1600 3,0,0
1605 0,0,0
1610 7.5,0,0
1615 93,0,0
1620 0,0,0
1625 0,0,0
```

TABLE 3.2 (Cont)

```
1630 BASIC PROP   T28C          AGAS
1635    1   0
1640 .5,19,24
1645 .776,0,0
1650 50.5,0,0
1655 3.71,0,0
1660 3.1,0,0
1665 127.5,0,0
1670 98.7,0,0
1675 2,0,0
1680 0,0,0
1685 4.32,0,0
1690 164.25,0,0
1695 0,0,0
1700 0,0,0
1705 B-PROP CQ    T28C          AGAS
1710    1   0
1715 .5,4,24
1720 .879,0,0
1725 50.5,0,0
1730 2.81,0,0
1735 2.22,0,0
1740 15,0,0
1745 6.6,0,0
1750 2,0,0
1755 10,0,0
1760 5.47,0,0
1765 0,0,0
1770 0,0,0
1775 0,0,0
1780 ADV PROP     TS2A          AGAS
1785    1   0
1790 .5,17,24
1795 .865,0,0
1800 96.6,0,0
1805 3.72,0,0
1810 2.75,0,0
1815 123.8,0,0
1820 109.4,0,0
1825 3,0,0
1830 0,0,0
1835 8.89,0,0
1840 143,0,0
1845 0,0,0
1850 0,0,0
```

TABLE 3.2 (Cont)

```
1855 BASIC HELO  T28C          AGAS
1860    1  0
1865 .5,18,24
1870 .776,0,0
1875 50.5,0,0
1880 3.71,0,0
1885 3.1,0,0
1890 122.5,0,0
1895 95.4,0,0
1900 2,0,0
1905 0,0,0
1910 4.32,0,0
1915 0,0,0
1920 0,0,0
1925 0,0,0
1930 PRE HELO    T28C          AGAS
1935    1  0
1940 .5,5,24
1945 .85,0,0
1950 50.5,0,0
1955 3.81,0,0
1960 3.2,0,0
1965 23.5,0,0
1970 23.6,0,0
1975 2,0,0
1980 0,0,0
1985 4.8,0,0
1990 37,0,0
1995 0,0,0
2000 0,0,0
2005 HELO PRIM   TH57          AGAS
2010    1  0
2015 .5,4,24
2020 .836,0,0
2025 12.6,0,0
2030 3.31,0,0
2035 2.96,0,0
2040 24.2,0,0
2045 24.4,0,0
2050 2,0,0
2055 0,0,0
2060 3,0,0
2065 35,0,0
2070 0,0,0
2075 0,0,0
```

TABLE 3.2 (Cont)

```
2080 HELO ADV     THIL          JP-4
2085    1  0
2090 .5,8,24
2095 .864,0,0
2100 100,0,0
2105 2.98,0,0
2110 2.77,0,0
2115 57,0,0
2120 59.8,0,0
2125 2,0,0
2130 0,0,0
2135 6.02,0,0
2140 35,0,
2145 0,0,0
2150 0,0,0
```

TABLE 3.3

DATA FILE PIPE

```
1000   14NAVY OFFICER
1005    3   0   0   0   0   0   2   0.0300
1010    4   9  12   0   0   0   3   0.0400
1015    5   0   0   0   0   0   4   0.0600
1020    6   0   0   0   0   0   5   0.0300
1025    7   8   0   0   0   0   6   0.0100
1030    0   0   0   0   0   0   7   0.0300
1035    0   0   0   0   0   0   8   0.0300
1040   10   0   0   0   0   0   9   0.1500
1045   11   0   0   0   0   0  10   0.0050
1050    0   0   0   0   0   0  11   0.0100
1055   13   0   0   0   0   0  12   0.1400
1060   14   0   0   0   0   0  13   0.0050
1065   15   0   0   0   0   0  14   0.0050
1070    0   0   0   0   0   0  15   0.0050
1075   14NAVY - AOC
1080    3   0   0   0   0   0   1   0.0800
1090    4   9  12   0   0   0   3   0.1300
1095    5   0   0   0   0   0   4   0.0750
1100    6   0   0   0   0   0   5   0.0300
1105    7   8   0   0   0   0   6   0.0200
1110    0   0   0   0   0   0   7   0.0400
1115    0   0   0   0   0   0   8   0.0400
1120   10   0   0   0   0   0   9   0.2300
1125   11   0   0   0   0   0  10   0.0100
1130    0   0   0   0   0   0  11   0.0200
1135   13   0   0   0   0   0  12   0.2000
1140   14   0   0   0   0   0  13   0.0050
1145   15   0   0   0   0   0  14   0.0050
1150    0   0   0   0   0   0  15   0.0050
1155   11MARINE
1160    3   0   0   0   0   0   2   0.0150
1165    4  12   0   0   0   0   3   0.0600
1170    5   0   0   0   0   0   4   0.0500
1175    6   0   0   0   0   0   5   0.0100
1180    7   8   0   0   0   0   6   0.0100
1185    0   0   0   0   0   0   7   0.0300
1190    0   0   0   0   0   0   8   0.0300
1195   13   0   0   0   0   0  12   0.1000
1200   14   0   0   0   0   0  13   0.0050
1205   15   0   0   0   0   0  14   0.0050
1210    0   0   0   0   0   0  15   0.0050
1215    8C-GRD & FOR.
1220    3   0   0   0   0   0   2   0.0200
1225    9  12   0   0   0   0   3   0.0500
1230   11   0   0   0   0   0   9   0.0500
1235    0   0   0   0   0   0  11   0.
1240   13   0   0   0   0   0  12   0.0500
1245   14   0   0   0   0   0  13   0.
1250   15   0   0   0   0   0  14   0.
1255    0   0   0   0   0   0  15   0.
1260  -99END OF FILE
```

TABLE 3.4

DATA FILE RUNDAT

```
1000   1PRIMARY      T34B
1005    9.380 10.080 10.970 11.850 12.680 13.120
1010   12.920 12.250 11.380 10.500  9.620  9.230
1015   0.1500 0.5000
1020   0.6300 0.6500 0.6900 0.7500 0.8400 0.8300
1025   0.8700 0.8300 0.8600 0.8800 0.7500 0.6800
1030   0.270000E+02 0.            0.
1035   0.130000E+01 0.            0.
1040   0.763889E-02 0.            0.
1045   0.121528E-01 0.            0.
1050   0.109000E+03 0.            0.
1055   0.900000E+01 0.            0.
1060   0.145833E-01 0.            0.
1065   0.500000E-01 0.            0.
1070   0.           0.            0.
1075   0.833333E-01 0.            0.
1080    1BASIC JET-A T-2A
1085    9.250 10.020 10.930 11.920 12.820 13.280
1090   13.050 12.350 11.450 10.430  9.480  9.100
1095   0.1500 0.5000
1100   0.5900 0.6300 0.7800 0.8200 0.8800 0.8500
1105   0.9000 0.9100 0.8100 0.8600 0.7500 0.7700
1110   0.480000E+02 0.            0.
1115   0.143000E+01 0.            0.
1120   0.829861E-02 0.            0.
1125   0.158334E-01 0.            0.
1130   0.560000E+02 0.            0.
1135   0.160000E+02 0.            0.
1140   0.190000E-01 0.            0.
1145   0.500000E-01 0.            0.
1150   0.           0.            0.
1155   0.833333E-01 0.            0.
1160    1BASIC JET-B T2BC
1165    9.250 10.020 10.930 11.920 12.280 13.280
1170   13.050 12.350 11.350 10.430  9.480  9.100
1175   0.1500 0.5000
1180   0.6000 0.6500 0.8000 0.8400 0.9000 0.8700
1185   0.9200 0.9400 0.8300 0.8900 0.7600 0.7900
1190   0.380000E+02 0.            0.
1195   0.147000E+01 0.            0.
1200   0.829861E-02 0.            0.
1205   0.158334E-01 0.            0.
1210   0.560000E+02 0.            0.
1215   0.130000E+02 0.            0.
1220   0.190000E-01 0.            0.
1225   0.500000E-01 0.            0.
1230   0.           0.            0.
1235   0.833333E-01 0.            0.
```

TABLE 3.4 (Cont)

```
1240   1B-JET G/CQ  T2BC
1245   9.380 10.080 10.970 11.850 12.680 13.120
1250  12.920 12.250 11.380 10.500  9.620  9.230
1255  0.1500 0.5000
1260  0.6800 0.6700 0.6900 0.7400 0.8900 0.8300
1265  0.8900 0.8500 0.8300 0.8900 0.7100 0.8100
1270  0.290000E+02 0.            0.
1275  0.111000E+01 0.            0.
1280  0.756945E-02 0.            0.
1285  0.143750E-01 0.            0.
1290  0.380000E+02 0.            0.
1295  0.100000E+02 0.            0.
1300  0.172500E-01 0.            0.
1305  0.500000E-01 0.            0.
1310  0.           0.            0.
1315  0.833333E-01 0.            0.
1320   1ADV JET-TF  TF9J
1325   9.500 10.200 10.980 11.850 12.530 12.650
1330  12.770 12.150 11.380 10.600  9.780  9.420
1335  0.1500 0.5000
1340  0.6800 0.7900 0.8100 0.8100 0.8600 0.8900
1345  0.9500 0.9500 0.9100 0.9000 0.8700 0.6600
1350  0.105000E+03 0.            0.
1355  0.136000E+01 0.            0.
1360  0.297570E-01 0.            0.
1365  0.250000E-01 0.            0.
1370  0.413000E+03 0.            0.
1375  0.330000E+02 0.            0.
1380  0.300000E-01 0.            0.
1385  0.500000E-01 0.            0.
1390  0.           0.            0.
1395  0.833333E-01 0.            0.
1400   1ADV JET-TA  TA4J
1405   9.500 10.200 10.980 11.850 12.530 12.650
1410  12.770 12.150 11.380 10.600  9.780  9.420
1415  0.1500 0.5000
1420  0.6800 0.7900 0.8100 0.8100 0.8600 0.8900
1425  0.9500 0.9500 0.9100 0.9000 0.8700 0.6600
1430  0.105000E+03 0.            0.
1435  0.136000E+01 0.            0.
1440  0.297570E-01 0.            0.
1445  0.250000E-01 0.            0.
1450  0.413000E+03 0.            0.
1455  0.330000E+02 0.            0.
1460  0.300000E-01 0.            0.
1465  0.500000E-01 0.            0.
1470  0.           0.            0.
1475  0.833333E-01 0.            0.
```

TABLE 3.4 (Cont)

```
1480    1BASIC PROP  T28C
1485    9.380 10.080 10.970 11.850 12.680 13.120
1490   12.920 12.250 11.380 10.500  9.620  9.230
1495   0.1500 0.5000
1500   0.6300 0.6500 0.7100 0.7600 0.8200 0.7700
1505   0.8100 0.8000 0.7600 0.8600 0.7300 0.6600
1510   0.750000E+02 0.            0.
1515   0.154000E+01 0.            0.
1520   0.458334E-02 0.            0.
1525   0.120486E-01 0.            0.
1530   0.278000E+03 0.            0.
1535   0.240000E+02 0.            0.
1540   0.144583E-01 0.            0.
1545   0.500000E-01 0.            0.
1550   0.           0.            0.
1555   0.833333E-01 0.            0.
1560    1B-PROP CQ   T28C
1565    9.380 10.080 10.970 11.850 12.680 13.120
1570   12.920 12.250 11.380 10.500  9.620  9.230
1575   0.1500 0.5000
1580   0.7600 0.7800 0.8200 0.8800 0.8800 0.8900
1585   0.8900 0.9000 0.8800 0.9500 0.8800 0.8100
1590   0.160000E+02 0.            0.
1595   0.103000E+01 0.            0.
1600   0.420139E-02 0.            0.
1605   0.255555E-01 0.            0.
1610   0.100000E+04 0.            0.
1615   0.600000E+01 0.            0.
1620   0.306667E-01 0.            0.
1625   0.500000E-01 0.            0.
1630   0.           0.            0.
1635   0.833333E-01 0.            0.
1640    1ADV PROP    TS2A
1645    9.500 10.200 10.980 11.850 12.530 12.850
1650   12.770 12.150 11.380 10.600  9.780  9.420
1655   0.1500 0.5000
1660   0.6700 0.7600 0.8500 0.8300 0.8900 0.9400
1665   0.9700 0.9700 0.9500 0.9400 0.8700 0.6700
1670   0.390000E+02 0.            0.
1675   0.278000E+01 0.            0.
1680   0.319445E-01 0.            0.
1685   0.232639E-01 0.            0.
1690   0.204000E+03 0.            0.
1695   0.130000E+02 0.            0.
1700   0.279167E-01 0.            0.
1705   0.500000E-01 0.            0.
1710   0.           0.            0.
1715   0.833333E-01 0.            0.
```

TABLE 3.4 (Cont)

```
1720    1BASIC HELO  T28C
1725   9.38 10.08 10.97 11.85 12.68 13.12
1730   12.92 12.25 11.38 10.5 9.62 9.23
1735   0.15 0.5
1740   .71 .77 .8 .87 .91 .86
1745   .92 .89 .89 .91 .85 .8
1750   14 0 0
1755   1.78 0 0
1760   .012777 0 0
1765   .015555 0 0
1770   1000. 0 0
1775   5. 0 0
1780   .01867 0 0
1785   .05 0 0
1790   0 0 0
1795   .08333 0 0
1800    1PRE HELO    T28C
1805    9.380 10.080 10.970 11.850 12.680 13.120
1810   12.920 12.250 11.380 10.500  9.620  9.230
1815   0.1500 0.5000
1820   0.7100 0.7700 0.8000 0.8700 0.9100 0.8600
1825   0.9200 0.8900 0.8900 0.9100 0.8500 0.8000
1830   0.140000E+02 0.            0.
1835   0.178000E+01 0.            0.
1840   0.127777E-01 0.            0.
1845   0.155555E-01 0.            0.
1850   0.100000E+04 0.            0.
1855   0.500000E+01 0.            0.
1860   0.186667E-01 0.            0.
1865   0.500000E-01 0.            0.
1870   0.           0.            0.
1875   0.833333E-01 0.            0.
1880    1HELO PRIM   TH57
1885    9.380 10.080 10.970 11.850 12.680 13.120
1890   12.920 12.250 11.380 10.500  9.620  9.230
1895   0.1500 0.5000
1900   0.7000 0.7100 0.7300 0.7900 0.8700 0.8700
1905   0.8900 0.9000 0.9000 0.9100 0.8100 0.7200
1910   0.220000E+02 0.            0.
1915   0.119000E+01 0.            0.
1920   0.270139E-01 0.            0.
1925   0.179861E-01 0.            0.
1930   0.200000E+02 0.            0.
1935   0.800000E+01 0.            0.
1940   0.215833E-01 0.            0.
1945   0.500000E-01 0.            0.
1950   0.           0.            0.
1955   0.833333E-01 0.            0.
```

TABLE 3.4 (Cont)

```
1960    1HELO ADV     TH1L
1965    9.380 10.080 10.970 11.850 12.680 13.120
1970   12.920 12.250 11.380 10.500  9.620  9.230
1975   0.1500 0.5000
1980   0.7500 0.7500 0.7700 0.8300 0.9100 0.9100
1985   0.9300 0.9400 0.9200 0.9500 0.8600 0.7600
1990   0.300000E+02 0.             0.
1995   0.179000E+01 0.             0.
2000   0.210070E-01 0.             0.
2005   0.139930E-01 0.             0.
2010   0.400000E+02 0.             0.
2015   0.100000E+02 0.             0.
2020   0.167917E-01 0.             0.
2025   0.500000E-01 0.             0.
2030   0.           0.             0.
2035   0.833333E-01 0.             0.
2120  -99END OF FILE.
```

TABLE 3.5

DATA FILE INVCO*

```
101 11.83,0,0,0,0,.02
102 63360.,1,0,1,0,422.40
103 47.2,1.17,13000,1,0,.19
104 24.8,1.12,25000,1,0,.19
105 25.7,1.15,50000,1,0,.19
106 22.00,1.23,5260,1,0,.19
107 11,1.15,0,0,0,.06
108 39.9,1.14,8000,1,0,.26
109 23.8,1.12,15000,1,0,.22
110 21500,1,0,0,0,0
111 3200,1.1,0,0,0,26.25
112 41.8,1.18,15000,1,0,.21
113 11000,1.17,0,0,0,105
114 0,0,0,0,0,0
115 28.3,1.15,21000,1,0,.16
116 30.4,1.13,16000,1,0,.16
117 330,1,0,1,0,0
118 5.75,1,0,1,0,.08
119 0,0,0,0,0,0
120 0,0,0,0,0,.08
121 71595.,0,0,1,0,986.
122 4.30,0,0,1,0,.04
123 0,0,0,0,0,0
124 0,0,0,0,0,0
125 5.15,1,0,1,0,0
126 0,0,0,0,0,0
127 11.83,0,0,0,0,.02
128 11.83,0,0,0,0,.02
129 9,1.15,0,0,0,.06
130 9,1.15,0,0,0,.06
131 0,0,0,0,0,0
132 0,0,0,0,0,0
133 0,0,0,0,0,0
134 0,0,0,0,0,0
135 0,0,0,0,0,0
136 0,0,0,0,0,0
137 0,0,0,0,0,0
138 0,0,0,0,0,0
139 0,0,0,0,0,0
140 0,0,0,0,0,0
141 0,0,0,0,0,0
142 0,0,0,0,0,0
143 0,0,0,0,0,0
144 0,0,0,0,0,0
145 0,0,0,0,0,0
146 0,0,0,0,0,0
147 0,0,0,0,0,0
148 0,0,0,0,0,0
149 0,0,0,0,0,0
150 0,0,0,0,0,0
```

TABLE 3.6

DATA FILE RPIFI*

```
101 01320,A/C PKNG APN,SY
102 12540,DIST PIPELIN,MI
103 14140,A/C ØP BLDG ,SF
104 17110,ACADEMC BLDG,SF
105 21110,MAINT HANGAR,SF
106 21910,PW MAINT SHP,SF
107 04210,GEN WAREHØUS,SF
108 55010,DISPENSARY  ,SF
109 61010,ADMIN ØFFICE,SF
110 71110,FAM HØUSING ,UN
111 72210,EM BARRACKS ,MN
112 72310,EM MESS HALL,SF
113 72415,BØQ         ,MN
114 72416,BØQ MESS    ,SF
115 74014,EXCHANGE    ,SF
116 74063,SERVICE CLUB,SF
117 81160,STAND BY GEN,UN
118 81230,ELEC DIST LN,LF
119 83210,SANITR SEWER,LF
120 84210,WATER DIS LN,LF
121 85110,RØADS       ,MI
122 85210,PARKING AREA,SY
123 87110,STØRM SEWER ,LF
124 87120,DRAIN DITCH ,LF
125 87210,SECURT FENCE,LF
126 00000,INELIG HØUSE,UN
127 01320,PER TAXIWAY ,SY
128 11320,TØT PKNG APN,SY
129 04210,SHED SPACE  ,SF
130 44210,TØT WAREHSE ,SF
1010 0,0
1020 0,0
1030 18702,0
1040 0,0
1050 319268,40849
1060 15359,21027
1070 0,0
1080 0,15136
1090 24689,24914
1100 530,256
1110 972,451
1120 18500,16151
```

TABLE 3.6 (Cont)

```
1130 168,0
1140 0,0
1150 0,17780
1160 12730,0
1170 0,0
1180 0,94925
1190 71683,0
1200 68420,0
1210 14.72,0
1220 90381,0
1230 57875,0
1240 36269,0
1250 79806,0
1260 110,168
1270 0,0
1280 348068,0
1290 0,0
1300 44783,33578
1510 .839,8000,9,1
1520 .839,8000,9,1
1530 .086,8000,9,1
1540 0,0,0,0
1550 0,0,0,0
1560 0,0,0,0
1570 0,0,0,0
1580 0,0,0,0
1590 0,0,0,0
1600 0,0,0,0
1610 2835000,100000,0
2010 0,0
2020 8.55,0
2030 57891,7692
2040 0,37661
2050 0,463301
2060 53273,20701
2070 0,0
2080 0,21100
2090 42527,235466
2100 1988,428
2110 869,1420
2120 33209,0
2130 412,204
```

TABLE 3.6 (Cont)

```
2140 0,0
2150 0,32499
2160 0,23334
2170 0,0
2180 405958,0
2190 174834,0
2200 252218,0
2210 45.26,0
2220 323433,0
2230 233152,0
2240 26812,0
2250 28652,0
2260 371,212
2270 0,0
2280 641380,0
2290 0,0
2300 491107,604445
2510 .839,8000,9,1
2520 .839,5000,2,2
2530 .82,5000,2,2
2540 .622,5000,2,2
2550 0,0,0,0
2560 0,0,0,0
2570 0,0,0,0
2580 0,0,0,0
2590 0,0,0,0
2600 0,0,0,0
2610 200000,1100000,0
3010 0,0
3020 2.4,0
3030 375,1409
3040 9475,4099
3050 99843,0
3060 4551,1071
3070 0,0
3080 0,8345
3090 7639,7118
3100 725,127
3110 674,0
3120 0,12816
3130 192,0
3140 0,0
```

TABLE 3.6 (Cont)

```
3150 6054.0
3160 2816.0
3170 0.0
3180 50170.0
3190 10015.0
3200 31645.0
3210 6.93.0
3220 37269.0
3230 174520.0
3240 8328.0
3250 20662.0
3260 648.60
3270 0.0
3280 358146.0
3290 0.0
3300 25126.12374
3510 .9.3350.1.2
3520 .9.3025.1.2
3530 0.0.0.0
3540 0.0.0.0
3550 0.0.0.0
3560 0.0.0.0
3570 0.0.0.0
3580 0.0.0.0
3590 0.0.0.0
3600 0.0.0.0
3610 165000.114960.0
4010 0.0
4020 4.31.0
4030 19114.0
4040 15165.0
4050 153944.130186
4060 0.25502
4070 0.0
4080 0.17601
4090 8277.27880
4100 790.195
4110 933.356
4120 28068.0
4130 153.100
4140 0.0
4150 14054.8608
```

TABLE 3.6 (Cont)

```
4160 0,7590
4170 0,0
4180 96211,6875
4190 63192,0
4200 69399,6960
4210 19.66,13.4
4220 140379,12400
4230 151177,0
4240 0,0
4250 58976,19000
4260 247,92
4270 0,0
4280 241954,0
4290 0,0
4300 32813,106738
4510 .925,8000,9,1
4520 .925,8000,9,1
4530 .075,8000,9,1
4540 .075,8000,9,1
4550 0,0,0,0
4560 0,0,0,0
4570 0,0,0,0
4580 0,0,0,0
4590 0,0,0,0
4600 0,0,0,0
4610 2835000,50000,0
5010 0,0
5020 1.86,0
5030 12217,0
5040 30023,0
5050 206538,0
5060 9080,0
5070 0,0
5080 19562,0
5090 47747,0
5100 720,115
5110 1236,0
5120 19241,0
5130 468,0
5140 0,0
5150 18610,0
5160 7507,0
```

TABLE 3.6 (Cont)

```
5170 0,0
5180 111360,0
5190 69119,0
5200 72089,0
5210 14.16,0
5220 77020,0
5230 12209,0
5240 0,0
5250 155289,0
5260 158,45
5270 0,0
5280 288263,0
5290 0,0
5300 85309,14880
5510 .9,8000,9,1
5520 .9,8000,9,1
5530 .745,6400,9,1
5540 0,0,0,0
5550 0,0,0,0
5560 0,0,0,0
5570 0,0,0,0
5580 0,0,0,0
5590 0,0,0,0
5600 0,0,0,0
5610 3465000,49980,0
6010 0,0
6020 17.03,0
6030 20274,0
6040 36700,93291
6050 321681,0
6060 32767,21998
6070 0,0
6080 0,16605
6090 71858,243163
6100 1732,303
6110 456,1503
6120 15264,2529
6130 1667,46
6140 0,0
6150 77188,1025
6160 15383,0
6170 0,0
```

TABLE 3.6 (Cont)

```
6180 659038,0
6190 138190,0
6200 693604,0
6210 55.56,0
6220 279451,0
6230 151792,0
6240 29417,0
6250 75682,0
6260 535,377
6270 0,0
6280 356000,0
6290 0,0
6300 177070,604949
6510 .9,8000,9,1
6520 .1,6137,9,1
6530 0,0,0,0
6540 0,0,0,0
6550 0,0,0,0
6560 0,0,0,0
6570 0,0,0,0
6580 0,0,0,0
6590 0,0,0,0
6600 0,0,0,0
6610 2268000,803800,0
7010 0,0
7020 0,0
7030 2371,0
7040 3494 9,0
7050 122240,0
7060 11713,0
7070 0,0
7080 7471,0
7090 15443,0
7100 600,127
7110 252,507
7120 0,12055
7130 574,0
7140 0,0
7150 5065,0
7160 0,4870
7170 0,0
7180 33986,0
```

TABLE 3.6 (Cont)

```
7190 9635,0
7200 21632,0
7210 6.78,0
7220 41805,0
7230 50020,0
7240 0,0
7250 32150,0
7260 183,128
7270 0,0
7280 177994,0
7290 0,0
7300 28451,1860
7510 .1,5200,1,2
7520 .9,6035,1,2
7530 .1,5296,1,2
7540 .9,5356,1,2
7550 0,0,0,0
7560 0,0,0,0
7570 0,0,0,0
7580 0,0,0,0
7590 0,0,0,0
7600 0,0,0,0
7610 15000,150000,0
8010 0,0
8020 3.86,0
8030 5231,0
8040 19311,29458
8050 231817,0
8060 22546,0
8070 0,0
8080 0,11204
8090 16244,18389
8100 921,381
8110 1151,24
8120 20167,13721
8130 484,0
8140 0,0
8150 2740,16834
8160 0,5251
8170 0,0
8180 133287,0
8190 51805,0
```

TABLE 3.6 (Cont)

```
8200 66314,0
8210 14.32,11.19
8220 125863,5648
8230 18186,0
8240 183694,1000
8250 56938,8000
8260 114,154
8270 0,0
8280 389800,0
8290 0,0
8300 38349,31796
8510 .9,6000,1,2
8520 .9,6000,1,2
8530 .1,6000,1,2
8540 .1,6000,1,2
8550 0,0,0,0
8560 0,0,0,0
8570 0,0,0,0
8580 0,0,0,0
8590 0,0,0,0
8600 0,0,0,0
8610 402040,784131,0
9010 0,0
9020 0,0
9030 0,0
9040 0,0
9050 0,0
9060 0,0
9070 0,0
9080 0,0
9090 0,0
9100 0,0
9110 0,0
9120 0,0
9130 0,0
9140 0,0
9150 0,0
9160 0,0
9170 0,0
9180 0,0
9190 0,0
9200 0,0
```

TABLE 3.6 (Cont)

```
9210  0,0
9220  0,0
9230  0,0
9240  0,0
9250  0,0
9260  0,0
9270  0,0
9280  0,0
9290  0,0
9300  0,0
9510  0,0,0,0
9520  0,0,0,0
9530  0,0,0,0
9540  0,0,0,0
9550  0,0,0,0
9560  0,0,0,0
9570  0,0,0,0
9580  0,0,0,0
9590  0,0,0,0
9600  0,0,0,0
9610  0,0,0
```

# IV. THE NFO TRAINING SYSTEM MODEL

## INTRODUCTION

4.1 This section discusses the Naval flight officer (NFO) training system option of the LSR module of the Static IFRS model. The user has nearly all the capabilities of the IFRS model for the NFO system that he has for the pilot system. Because the questions and print options are the same for both models only the new features and restrictions are discussed.

## GENERAL PROCEDURE

4.2 To run the NFO training system model, the user runs the regular Static IFRS program. However, he must respond with a 2 to the third question in the model.

```
ENTER TRAINING FLOW NO.
1 FOR PILOT, 2 FOR NFO. (X)?2
```

This tells the model to access the appropriate NFO data files. (See Section V for a discussion of the data file.)

4.3 Because additional planning factors and differences in the training system had to be considered, the following programming changes were required in order for IFRS model to simulate the NFO training system:

- Allow six following training phases from a given phase, i.e., one phase can be a prerequisite for six other phases (previously there were three).

- Add three new planning factors
  - NFO flight instructor utilization
  - NFO flight instruction hours required to graduate a student
  - NFO flight instructor training time.

4.4 When the user now modifies or adds a pipeline, he must enter data or zeros for six following training phases. Because of the second change, additional instructor information must be printed. This is printed in the manpower summary section. A sample of this printout is shown in Table 4.1. The line with NFOs on it refers to NFO flight instructors. The support and administrative officers are calculated as a function of the total number of instructors.

4.5 When the user runs the simple constraint calculations for NFOs, the model includes the NFO flight instructors and those under training in its computations. The planning factors for the runway and airspace calculations were not available and thus hypothetical values are presently in the data files (i.e., data file NFORUNDA and NACDA*).

Differences in Pilot and NFO Usage

4.6 Since the IFRS model was initially designed for the planning factors associated with the pilot training system and the Navy desired to use either pilot or NFO, the inclusion of the additional NFO planning factors had to be carefully handled. Consequently, user flexibility is reduced. The main restrictions are listed as follows:

- Features under level 3 or 4 are not as extensive as they are in the pilot model.
  - The option to modify or list the planning factors in a phase does not include the three additional NFO planning factors.
  - The option to delete or add a training phase does not include the three new planning factors.
  - The three new planning factors are not validated when they are read from the data file.
  - The three new planning factors are not included if the data file SAVBCS is generated.
- Only the data files associated with the LSR module will be accessed automatically. If the user wants to run the complete Static IFRS model to obtain total system cost, the pilot aircraft data file (ACDAT*) must be replaced by

TABLE 4.1

NFO INSTRUCTOR SUMMARY

| TRAINING PHASE | *FLIGHT INSTRUCTORS* EFFECT | IUT | TOTAL | LSO REQMT | ADMIN OFF | TOTAL OFF | TOTAL ENL |
|---|---|---|---|---|---|---|---|
| AOC SCHOOL | 0. | 0. | 0. | 0. | 3. | 3. | 0. |
| NFO'S | 0. | 0. | 0. | | | | |
| ENVIRO INDOC | 0. | 0. | 0. | 0. | 2. | 2. | 0. |
| NFO'S | 0. | 0. | 0. | | | | |
| VT-10(TC-45) | 9. | 1. | 11. | 0. | 10. | 21. | 42. |
| NFO'S | 0. | 0. | 0. | | | | |
| JET FAM | 0. | 0. | 0. | 0. | 1. | 1. | 0. |
| NFO'S | 0. | 0. | 0. | | | | |
| RIO | 21. | 3. | 24. | 0. | 8. | 43. | 165. |
| NFO'S | 10. | 1. | 12. | | | | |
| BJN | 7. | 1. | 8. | 0. | 3. | 19. | 56. |
| NFO'S | 7. | 1. | 8. | | | | |
| VT-29 | 21. | 3. | 24. | 0. | 7. | 43. | 124. |
| NFO'S | 11. | 1. | 12. | | | | |
| AELW | 1. | 0. | 1. | 0. | 1. | 4. | 25. |
| NFO'S | 1. | 0. | 1. | | | | |
| AIC | 1. | 0. | 1. | 0. | 0. | 2. | 4. |
| NFO'S | 0. | 0. | 0. | | | | |
| ATDS | 1. | 0. | 1. | 0. | 1. | 2. | 14. |
| NFO'S | 1. | 0. | 1. | | | | |
| AEW | 1. | 0. | 1. | 0. | 1. | 2. | 14. |
| NFO'S | 1. | 0. | 1. | | | | |
| AIC | 1. | 0. | 1. | 0. | 0. | 1. | 3. |
| NFO'S | 0. | 0. | 0. | | | | |
| ASAC | 1. | 0. | 1. | 0. | 0. | 1. | 3. |
| NFO'S | 0. | 0. | 0. | | | | |
| VT-10(T-1A) | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| NFO'S | 0. | 0. | 0. | | | | |
| AIC-OTHER | 0. | 0. | 0. | 0. | 0. | 0. | 0. |
| NFO'S | 0. | 0. | 0. | | | | |

the NFO aircraft data file (NACDA*) prior to the start of the run. Also no additional base specific information is included in the NFO training system (i.e., only the nine existing bases are available).

- Per the Navy's request, the pilot and NFO training systems cannot be run simultaneously. The reasons are:
  - The model is restricted to a maximum of 25 training phases in a system (currently NFO and pilot have 15 each).
  - The NFO model contains additional planning factors.
  - The model permits only 21 aircraft types, including tenant aircraft.
  - Longer run time is required for every run through the LSR module if both are combined.

The last restriction can be partially overcome in several ways.

4.7 How to Run Total Static IFRS Model for NFO. To include all or part of the NFO training system in the total system cost, the following suggestions are made:

- To get the cost of just adding the NFO system in with the pilot system, run the NFO model and set all the tenant data to zero in data file BASED*. These results are pure NFO requirements. The user can then treat the NFO personnel as additional tenants in the pilot system to determine incremental facilities requirements. However, the user is still limited by the number of types of aircraft. Since the NFOs require little flying, the error should be minimal.
- If the user only wants to see the effect of combining a few NFO phases with the pilot systems, the best way is to assume those NFO phases are additional pilot phases and add a new pipeline to include those phases. Some error may be introduced because this will not consider the NFO flight instructors; however, this can be overcome by adjusting the regular flight instructor factor. Also the attrition rates in the pipeline will have to be adjusted to reflect the combined NFO system attrition rate.
- A much more complicated way requires that the user becomes familiar with the data files LSROUT and RUNWAY generated by the Static IFRS model. These

files could be saved after a pilot and NFO run and only those phases of interest could be extracted and set up into new composite files. Then, when the user enters PART2*, the new LSROUT and RUNWAY files will be accessed. This method requires that the aircraft data file be modified. However, the total system cost of only those phases considered will be calculated.

4.8 The user does not have the flexibility he has with the pilot training system. However, the LSR section is completely automatic and identical to the pilot system for levels 1 and 2. Because little flying time is required and also since many of the bases where NFO training is conducted are not included, an accurate system cost is not easily calculated.

# V. NFO DATA FILES

## INTRODUCTION

5.1 The purpose of this section is to discuss and list the data files for the NFO training system. Because the data files are read by the same Static IFRS program, their format and data content are the same as the pilot data files. To determine the proper planning factor on each line, the user must refer to the IFRS II User's Manual.[1/]

## DATA FILES

5.2 Because the NFO data files are similar in content to the pilot data files, they were given similar names. The relationship is shown in the following chart:

| Data Files | |
|---|---|
| Pilot | NFO |
| BASCAS | NFOBASCA |
| PIPE | NFOPIPE |
| RUNDAT | NFORUNDA |
| ACDAT* | NACDA* |

1/ The Phase II Static IFRS is documented in ORI Technical Report 583, Development of a Preliminary Automated Total Systems Model for the Integrated Facilities Requirements Study (IFRS) Phase II, 9 February 1970. Volume III is the User's Manual and Volume IV is the Programmer's Manual.

5.3 The data files are listed in Tables 5.1 to 5.4 in this section. Only two files contain changed format, NFOPIPE and NFOBASCA. Data file NFOPIPE now requires data or zeros for six following phases. (This same change now applies to pilot PIPE file also.) Data file NFOBASCA has three additional lines of data added to the end of each training phase block. These data are for the following planning factors (variable names are in parentheses):

- NFO flight instructor utilization (FUN)
- NFO flight instructor hours per student (FIHN)
- Time to train (months) an NFO flight instructor (FTRN).

The user can use free formatting for all lines in NFOBASCA.

5.4 All other NFO data files have the same description as the pilot data files. Thus the user who is familiar with them will have no trouble with the additional NFO data files.

TABLE 5.1

DATA FILE NFOPIPE

```
1000   12NAVY OFFICER
1005    3  0  0  0  0  0  2  .04
1010    4  7  8  9 11  0  3  .12
1015    5  6  0  0  0  0  4  .0
1020    0  0  0  0  0  0  5  .20
1025    0  0  0  0  0  0  6  .03
1030    0  0  0  0  0  0  7  .02
1035    0  0  0  0  0  0  8  .02
1040   10  0  0  0  0  0  9  .03
1045    0  0  0  0  0  0 10  .05
1050   12  0  0  0  0  0 11  .03
1055   13  0  0  0  0  0 12  .03
1060    0  0  0  0  0  0 13  .03
1065   12NAVY - AOC
1070    3  0  0  0  0  0  1  .10
1075    4  7  8  9 11  0  3  .12
1080    5  6  0  0  0  0  4  .0
1085    0  0  0  0  0  0  5  .20
1090    0  0  0  0  0  0  6  .03
1095    0  0  0  0  0  0  7  .02
1100    0  0  0  0  0  0  8  .02
1105   10  0  0  0  0  0  9  .03
1110    0  0  0  0  0  0 10  .05
1115   12  0  0  0  0  0 11  .03
1120   13  0  0  0  0  0 12  .03
1125    0  0  0  0  0  0 13  .03
1130    5MARINE
1135    3  0  0  0  0  0  2  .02
1140    4  0  0  0  0  0  3  .05
1145    5  6  0  0  0  0  4  .0
1150    0  0  0  0  0  0  5  .12
1155    0  0  0  0  0  0  6  .01
1160    9NAVY REFRESH
1165    0  0  0  0  0  0  5  .0
1170    0  0  0  0  0  0  6  .0
1175    0  0  0  0  0  0  7  .0
1180    0  0  0  0  0  0  8  .0
1185   10  0  0  0  0  0  9  .0
1190    0  0  0  0  0  0 10  .0
1195   12  0  0  0  0  0 11  .0
1200   13  0  0  0  0  0 12  .0
1205    0  0  0  0  0  0 13  .0
1210    7OTHER
1215    0  0  0  0  0  0  8  .0
1220   10  0  0  0  0  0  9  .0
1225    0  0  0  0  0  0 10  .0
1230   12  0  0  0  0  0 11  .0
1235   13  0  0  0  0  0 12  .0
1240    0  0  0  0  0  0 13  .0
1245    0  0  0  0  0  0 15  .0
1250 -99END OF FILE
```

TABLE 5.2

DATA FILE NFOBASCA

```
1000 NY,
1005 1,156,48,1
1010 1000,1000,1000,1000
1015 1000,1015,1000,48
1020 50 50 1020
1025 15
1030 AOC SCHOOL                                          *
1035   0  0
1040 .5,10,0
1045 1.0,0,0
1050 0,0,0
1055 5,0,0
1060 0,0,0
1065 0,0,0
1070 50,0,0
1075 0,0,0
1080 0,0,0
1085 0,0,0
1090 489,0,0
1095 700,0,0
1100 3,0,0
1105 0,0,0
1110 0,0,0
1115 3,0,0
1120 ENVIRO INDOC                                        *
1125   0  0
1130 .5,5,0
1135 1.0,0,0
1140 0,0,0
1145 5,0,0
1150 0,0,0
1155 0,0,0
1160 50,0,0
1165 0,0,0
1170 0,0,0
1175 0,0,0
1180 200,0,0
1185 700,0,0
1190 3,0,0
1195 0,0,0
1200 0,0,0
1205 3,0,0
```

TABLE 5.2 (Cont)

```
1210 VT-10(TC-45)TC45          AGAS                    *
1215    1  0
1220 .5,16,24
1225 .90,0,0
1230 0,0,0
1235 3.75,0,0
1240 3,0,0
1245 6.7,0,0
1250 7.2,0,0
1255 3,0,0
1260 0,0,0
1265 5.04,0,0
1270 0,0,0
1275 0,0,0
1280 0,0,0
1285 3,0,0
1290 0,0,0
1295 3,0,0
1300 JET FAM                                           *
1305    0  0
1310 .5,3,0
1315 1.0,0 0
1320 0,0,0
1325 5,0,0
1330 0,0,0
1335 0,0,0
1340 50,0,0
1345 0,0,0
1350 0,0,0
1355 0,0,0
1360 200,0,0
1365 700,0,0
1370 3,0,0
1375 0,0,0
1380 0,0,0
1385 3,0,0
```

TABLE 5.2 (Cont)

```
1390 RIO          T-39        AGAS                    *
1395   1  0
1400 .5,9.8,24
1405 .93,0,0
1410 0,0,0
1415 3.5,0,0
1420 2.5,0,0
1425 53.3,0,0
1430 53.3 0,0
1435 3,0,0
1440 0,0,0
1445 9.16,0,0
1450 0,0,0
1455 0,0,0
1460 0,0,0
1465 2.5,0,0
1470 26.6,0,0
1475 3,0,0
1480 BJN          T-39        AGAS                    *
1485   1  0
1490 .5,4,24
1495 .95,0,0
1500 0,0,0
1505 3.5,0,0
1510 2.5,0,0
1515 18.6,0,0
1520 18.6,0,0
1525 3,0,0
1530 0,0,0
1535 9.16,0,0
1540 0,0,0
1545 0,0,0
1550 0,0,0
1555 2.5,0,0
1560 18.6,0,0
1565 3,0,0
```

TABLE 5.2 (Cont)

```
1570 VT-29          T-29          JP-4                    *
1575    1   0
1580 .5,12,24
1585 .90,0,0
1590 0,0,0
1595 3.25,0,0
1600 3.3,0,0
1605 18.8,0,0
1610 60,0,0
1615 3,0,0
1620 0,0,0
1625 15.19,0,0
1630 0,0,0
1635 0,0,0
1640 0,0,0
1645 3.3,0,0
1650 30,0,0
1655 3,0,0
1660 AELW           C121          AGAS                    *
1665    1   0
1670 .5,7.6,24
1675 .99,0,0
1680 0,0,0
1685 3.12,0,0
1690 3,0,0
1695 5.2,0,0
1700 10.4,0,0
1705 3,0,0
1710 0,0,0
1715 37.5,0,0
1720 0,0,0
1725 0,0,0
1730 0,0,0
1735 3,0,0
1740 11.5,0,0
1745 3,0,0
```

TABLE 5.2 (Cont)

```
1750 AIC          T-33          JP-4                    *
1755    1  0
1760 .5,6.6,24
1765 .90,0,0
1770 0,0,0
1775 3.15,0,0
1780 2.1,0,0
1785 12.7,0,0
1790 12.7,0,0
1795 3,0,0
1800 0,0,0
1805 3.99,0,0
1810 0,0,0
1815 0,0,0
1820 0,0,0
1825 2.1,0,0
1830 0,0,0
1835 3,0,0
1840 ATDS         C121          AGAS                    *
1845    1  0
1850 .5,12,24
1855 .99,0,0
1860 0,0,0
1865 3.12,0,0
1870 3,0,0
1875 5.7,0,0
1880 11.4,0,0
1885 3,0,0
1890 0,0,0
1895 37.5,0,0
1900 0,0,0
1905 0,0,0
1910 0,0,0
1915 3,0,0
1920 12,0,0
1925 3,0,0
```

TABLE 5.2 (Cont)

```
1930 AEW          C121          AGAS                    *
1935    1  0
1940 .5,5,24
1945 .99,0,0
1950 0,0,0
1955 3.12,0,0
1960 3,0,0
1965 7.9,0,0
1970 15.8,0,0
1975 3,0,0
1980 0,0,0
1985 37.5 0,0
1990 0,0,0
1995 0,0,0
2000 0,0,0
2005 3,0,0
2010 20.3,0,0
2015 3,0,0
2020 AIC          T-33          JP-4                    *
2025    1  0
2030 .5,6.6,24
2035 .90,0,0
2040 0,0,0
2045 3.15,0,0
2050 2.1,0,0
2055 12.7,0,0
2060 12.7,0,0
2065 3,0,0
2070 0,0,0
2075 3.99,0,0
2080 0,0,0
2085 0,0,0
2090 0,0,0
2095 2.1,0,0
2100 0,0,0
2105 3,0,0
```

TABLE 5.2 (Cont)

```
2110 ASAC          TS2A          AGAS                    *
2115    1  0
2120 .5,4.2,24
2125 .86,0,0
2130 0,0,0
2135 4.62,0,0
2140 2.2,0,0
2145 10.8,0,0
2150 10.8,0,0
2155 3,0,0
2160 0,0,0
2165 8.89,0,0
2170 0,0,0
2175 0,0,0
2180 0,0,0
2185 2.2,0,0
2190 0,0,0
2195 3,0,0
2200 VT-10(T-1A) T-1A          JP-4                    *
2205    1  0
2210 .5,16,24
2215 .90,0,0
2220 0,0,0
2225 1.63,0,0
2230 3,0,0
2235 3,0,0
2240 3.2,0,0
2245 3,0,0
2250 0,0,0
2255 5.51,0,0
2260 0,0,0
2265 0,0,0
2270 0,0,0
2275 3,0,0
2280 0,0,0
2285 3,0,0
```

TABLE 5.2 (Cont)

```
2290 AIC-OTHER    T-33          JP-4                    *
2295    1   0
2300 .5,6.6,24
2305 .90,0,0
2310 0,0,0
2315 3.15,0,0
2320 2.1,0,0
2325 12.7,0,0
2330 12.7,0,0
2335 3,0,0
2340 0,0,0
2345 3.99,0,0
2350 0,0,0
2355 0,0,0
2360 0,0,0
2365 2.1,0,0
2370 0,0,0
2375 3,0,0
```

TABLE 5.3

DATA FILE NFORUNDA

```
1000    1VT-10(TC-45)TC45
1005 9.25 10.0 10.9 11.9 12.5 13.0
1010 13.0 12.2 11.4 10.5 9.5 9.2
1015 .15 .5
1020 .65 .65 .8 .8 .85 .9
1025 .9 .85 .8 .8 .75 .7
1030 10 0 0
1035 1 0 0
1040 .01 0 0
1045 .01 0 0
1050 100 0 0
1055 10 0 0
1060 .01 0 0
1065 .10 0 0
1070 0 0 0
1075 .08 0 0
1080    1RIO          T-39
1085 9.25 10.0 10.9 11.9 12.5 13.0
1090 13.0 12.2 11.4 10.5 9.5 9.2
1095 .15 .5
1100 .65 .65 .8 .8 .85 .9
1105 .9 .85 .8 .8 .75 .7
1110 10 0 0
1115 1 0 0
1120 .01 0 0
1125 .01 0 0
1130 100 0 0
1135 10 0 0
1140 .01 0 0
1145 .10 0 0
1150 0 0 0
1155 .08 0 0
1160    1BJN          T-39
1165 9.25 10.0 10.9 11.9 12.5 13.0
1170 13.0 12.2 11.4 10.5 9.5 9.2
1175 .15 .5
1180 .65 .65 .8 .8 .85 .9
1185 .9 .85 .8 .8 .75 .7
1190 10 0 0
1195 1 0 0
1200 .01 0 0
1205 .01 0 0
1210 100 0 0
1215 10 0 0
1220 .01 0 0
1225 .10 0 0
1230 0 0 0
1235 .08 0 0
```

TABLE 5.3 (Cont)

```
1240    1VT-29          T-29
1245 9.25 10.0 10.9 11.9 12.5 13.0
1250 13.0 12.2 11.4 10.5 9.5 9.2
1255 .15 .5
1260 .65 .65 .8 .8 .85 .9
1265 .9 .85 .8 .8 .75 .7
1270 10 0 0
1275 1 0 0
1280 .01 0 0
1285 .01 0 0
1290 100 0 0
1295 10 0 0
1300 .01 0 0
1305 .10 0 0
1310 0 0 0
1315 .08 0 0
1320    1AELW           C121
1325 9.25 10.0 10.9 11.9 12.5 13.0
1330 13.0 12.2 11.4 10.5 9.5 9.2
1335 .15 .5
1340 .65 .65 .8 .8 .85 .9
1345 .9 .85 .8 .8 .75 .7
1350 10 0 0
1355 1 0 0
1360 .01 0 0
1365 .01 0 0
1370 100 0 0
1375 10 0 0
1380 .01 0 0
1385 .10 0 0
1390 0 0 0
1395 .08 0 0
1400    1AIC            T-33
1405 9.25 10.0 10.9 11.9 12.5 13.0
1410 13.0 12.2 11.4 10.5 9.5 9.2
1415 .15 .5
1420 .65 .65 .8 .8 .85 .9
1425 .9 .85 .8 .8 .75 .7
1430 10 0 0
1435 1 0 0
1440 .01 0 0
1445 .01 0 0
1450 100 0 0
1455 10 0 0
1460 .01 0 0
1465 .10 0 0
1470 0 0 0
1475 .08 0 0
```

TABLE 5.3 (Cont)

```
1480    1ATDS           C121
1485 9.25 10.0 10.9 11.9 12.5 13.0
1490 13.0 12.2 11.4 10.5 9.5 9.2
1495 .15 .5
1500 .65 .65 .8 .8 .85 .9
1505 .9 .85 .8 .8 .75 .7
1510 10 0 0
1515 1 0 0
1520 .01 0 0
1525 .01 0 0
1530 100 0 0
1535 10 0 0
1540 .01 0 0
1545 .10 0 0
1550 0 0 0
1555 .08 0 0
1560    1AEW            C121
1565 9.25 10.0 10.9 11.9 12.5 13.0
1570 13.0 12.2 11.4 10.5 9.5 9.2
1575 .15 .5
1580 .65 .65 .8 .8 .85 .9
1585 .9 .85 .8 .8 .75 .7
1590 10 0 0
1595 1 0 0
1600 .01 0 0
1605 .01 0 0
1610 100 0 0
1615 10 0 0
1620 .01 0 0
1625 .10 0 0
1630 0 0 0
1635 .08 0 0
1640    1AIC            T-33
1645 9.25 10.0 10.9 11.9 12.5 13.0
1650 13.0 12.2 11.4 10.5 9.5 9.2
1655 .15 .5
1660 .65 .65 .8 .8 .85 .9
1665 .9 .85 .8 .8 .75 .7
1670 10 0 0
1675 1 0 0
1680 .01 0 0
1685 .01 0 0
1690 100 0 0
1695 10 0 0
1700 .01 0 0
1705 .10 0 0
1710 0 0 0
1715 .08 0 0
```

TABLE 5.3 (Cont)

```
1720    1ASAC          TS2A
1725 9.25 10.0 10.9 11.9 12.5 13.0
1730 13.0 12.2 11.4 10.5 9.5 9.2
1735 .15 .5
1740 .65 .65 .8 .8 .85 .9
1745 .9 .85 .8 .8 .75 .7
1750 10 0 0
1755 1 0 0
1760 .01 0 0
1765 .01 0 0
1770 100 0 0
1775 10 0 0
1780 .01 0 0
1785 .10 0 0
1790 0 0 0
1795 .08 0 0
1800    1VT-10(T-1A) T-1A
1805 9.25 10.0 10.9 11.9 12.5 13.0
1810 13.0 12.2 11.4 10.5 9.5 9.2
1815 .15 .5
1820 .65 .65 .8 .8 .85 .9
1825 .9 .85 .8 .8 .75 .7
1830 10 0 0
1835 1 0 0
1840 .01 0 0
1845 .01 0 0
1850 100 0 0
1855 10 0 0
1860 .01 0 0
1865 .10 0 0
1870 0 0 0
1875 .08 0 0
1880    1AIC-OTHER    T-33
1885 9.25 10.0 10.9 11.9 12.5 13.0
1890 13.0 12.2 11.4 10.5 9.5 9.2
1895 .15 .5
1900 .65 .65 .8 .8 .85 .9
1905 .9 .85 .8 .8 .75 .7
1910 10 0 0
1915 1 0 0
1920 .01 0 0
1925 .01 0 0
1930 100 0 0
1935 10 0 0
1940 .01 0 0
1945 .10 0 0
1950 0 0 0
1955 .08 0 0
```

TABLE 5.4

DATA FILE NACDA*

```
1011 TC45
1012 34.2,47.7,62.7,87.7
1013 24,48,144,96
1014 175,5,50
1015 5000,1,2
1016 1,1
1017 1000
1021 T-39
1022 25.8,32.8,47.8,72.8
1023 24,48,144,96
1024 175,5,50
1025 3000,1,2
1026 40,2.57
1027 150
1031 T-29
1032 31,31,69.2,90
1033 24,48,144,96
1034 175,5,50
1035 5000,1,2
1036 1,1
1037 1000
1041 C121
1042 116.2,123,143,163
1043 24,48,144,96
1044 525,30,200
1045 8000,2,1
1046 1,1
1047 1000
1051 T-33
1052 31,31,69.2,90
1053 24,48,144,96
1054 175,5,50
1055 5000,1,2
1056 1,1
1057 1000
1061 TS2A
1062 34,35,46,50
1063 15,24,144,60
1064 400,8,115
1065 8000,2,1
1066 2000,14.89
1067 179
```

TABLE 5.4 (Cont)

```
1071 T-1A
1072 38.8,38.8,74.7,90
1073 24,48,144,96
1074 375,8,110
1075 5000,1,2
1076 1,1
1077 1000
1081 ZERO
1082 0,0,0,0
1083 0,0,0,0
1084 0,0,0
1085 0,0,0
1086 0,0
1087 0
1091 ZERO
1092 0,0,0,0
1093 0,0,0,0
1094 0,0,0
1095 0,0,0
1096 0,0
1097 0
1101 ZERO
1102 0,0,0,0
1103 0,0,0,0
1104 0,0,0
1105 0,0,0
1106 0,0
1107 0
1111 ZERO
1112 0,0,0,0
1113 0,0,0,0
1114 0,0,0
1115 0,0,0
1116 0,0
1117 0
1121 ZERO
1122 0,0,0,0
1123 0,0,0,0
1124 0,0,0
1125 0,0,0
1126 0,0
1127 0
```

TABLE 5.4 (Cont)

```
1131 ZERO
1132 0,0,0,0
1133 0,0,0,0
1134 0,0,0
1135 0,0,0
1136 0,0
1137 0
1141 ZERO
1142 0,0,0,0
1143 0,0,0,0
1144 0,0,0
1145 0,0,0
1146 0,0
1147 0
1151 ZERO
1152 0,0,0,0
1153 0,0,0,0
1154 0,0,0
1155 0,0,0
1156 0,0
1157 0
1161 VF
1162 34.5,34.5,67.9,90
1163 15,24,144,60
1164 375,8,110
1165 0,2,1
1166 50300,1
1167 0
1171 VT
1172 35.5,35.5,68,90
1173 24,48,144,96
1174 375,8,110
1175 0,1,2
1176 180000,2
1177 0
1181 VR
1182 93.9,117.5,137.5,157.5
1183 6,12,144,24
1184 350,15,125
1185 0,2,2
1186 189000,2
1187 0
```

TABLE 5.4 (Cont)

```
1191 VO
1192 27.7,37.2,57.2,77.2
1193 24,48,144,96
1194 175,5,50
1195 0,1,2
1196 5000,2
1197 0
1201 VW
1202 40,50,65,90
1203 6,12,144,12
1204 900,50,275
1205 0,2,2
1206 360000,2
1207 0
1211 H
1212 52.2,44,66,110
1213 12,20,144,24
1214 250,8,75
1215 0,1,2
1216 18700,2
1217 0
```

# VI. PROGRAMMING CHANGES

6.1 Changes were made in the Static IFRS programs for the following reasons:

- To include the NFO training system
- To make requested print changes
- To correct previously undetected errors
- To allow the Dynamic IFRS model to use some of the Static IFRS programs (LSR1 and LSR2).

6.2 In the following sections of this manual, those programs that have been changed are discussed. Either a listing of the program or a listing of the lines changed is given. In most cases the discussion of the change is all that is given, since little, if any, of the program logic and flow is affected. The original Phase II line numbers were preserved (i.e., programs were not resequenced) and thus the new lines can be readily identified.

# VII. PROGRAM LSRM

7.1 The new version of program LSRM is given in Table 7.1. The changes are:

- Three NFO planning factor variables have been added to common (line number 190)
  - NFO flight instructor utilization (FUN)
  - NFO flight instructor hours per student (FIHN)
  - NFO flight instructor training period (FTRN)
- Question 1 (level of complexity) changed (in format number 700).

TABLE 7.1

PROGRAM LSRM LISTING

```
99C - - LSRM  8/19/70
100       COMMON IY,ISW,SW(2),IS(7)
120       COMMON NAME(25,3),NPLA(25,3),NFUEL(25,3),NACD(25,3),ATP(25),
140      &WK(25),TOD(25),NAC(25),NAD(25),WX(25,3),GAS(25,3),AU(25,3),
160      &FU(25,3),SFH(25,3),FIH(25,3),FTR(25,3),FSO(25,3),AMO(25,3),
180      &ASH(25,3),AIH(25,3),AITR(25,3)
190       COMMON FUN(25,3),FIHN(25,3),FTRN(25,3)
200       COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
220      &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
240       COMMON IBC,IL,IP,N,ITEM,IDEL(51),BMAX(15)
260       KILL=0
280       IBC=0
300       IF(IS(7).NE.0)GO TO 200
320     5 PRINT 700
340    10 INPUT 701,LEVLSR
360       IF(LEVLSR)30,30,20
380    20 IF(LEVLSR-4)40,40,30
400    30 PRINT 702
420       GO TO 10
440    40 PRINT 703
460    50 INPUT,WPY,AFD
480       IF(WPY)90,90,60
500    60 IF(WPY-52.)70,70,90
520    70 IF(AFD)90,90,80
540    80 IF(AFD-365.)100,100,90
560    90 PRINT 702
580       GO TO 50
600   100 ISW=LEVLSR
620       SW(1)=AFD
640       SW(2)=WPY
660   200 LEVLSR=ISW
680       IF(LEVLSR.EQ.0)GO TO 5
700       AFD=SW(1)
720       WPY=SW(2)
740       IF(IS(7).EQ.2)LEVLSR=-LEVLSR
760       CHAIN"XLSR1*"
780   700 FORMAT(26H ENTER LEVEL OF COMPLEXITY/ " 1 LIMITED
800      & DATA INPUT/OUTPUT - NO ADJUSTMENTS OR MODIFICATIONS"/
820      &" 2 DETAILED INPUT/OUTPUT - OPTION TO CONSTRAIN LSR
822      & OUTPUT"/" 3 MODIFY PHASE DATA"/" 4 COMBINE
824      & OPTIONS 2 AND 3")
840   701 FORMAT(I1)
860   703 FORMAT(" ENTER TRAINING WEEKS PER YEAR"/" AND ANNUAL FLY-
880      &DAYS (XX.,XXX.)")
900   702 FORMAT(23H INVALID REPLY - REPEAT)
920       END
```

# VIII. PROGRAM LSR1

8.1 Program LSR1 is listed in Table 8.1. The main changes in this program resulted from the addition of the NFO option and the entry from the Dynamic IFRS model to read the data files. The changes are confined to the main program (line 101 to 1441). Most of the changes are easily found since they have different line numbers. The original Phase II line numbers were preserved for the program and thus the new line numbers are easily identified.

8.2 The changes made were:

- Addition of NFO planning factors to the common area of storage. This had to be done in each subroutine (e.g., lines 191, 4971, 6031) and required 225 additional words of storage.
- Option to use pilot or NFO data files. This option is stored in ISWTCH(5) (lines 251 to 261). Then based on ISWTCH(5)
  - The proper data file must be opened and read (lines 263 to 321)
  - The proper planning factors must be read or skipped (lines 785 to 793)
- Option to use the simple constraints is asked at line 1042. If they are to be used, the program sets the indicator ISWTCH(4) equal to -1 and then transfers control to XLSR3.
- Lines 7365 to 7370 were added to ensure that blanks will be written on SAVBCS.
- Line 4521 was deleted.

TABLE 8.1

PROGRAM LSR1 LISTING

```
99C- - - LSR1D FOR NFO  11/30/70
101      COMMON IYEAR,ISWTCH(10)
121      COMMON NAME(25,3),NPLA(25,3),NFUEL(25,3),NACD(25,3),ATP(25),
141     &WK(25),TOD(25),NAC(25),NAD(25),WX(25,3),GAS(25,3),AU(25,3),
161     &FU(25,3),SFH(25,3),FIH(25,3),FTR(25,3),FSO(25,3),AMO(25,3),
181     &ASH(25,3),AIH(25,3),AITR(25,3)
191      COMMON FUN(25,3),FIHN(25,3),FTRN(25,3)
201      COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
221     &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
241      COMMON IBC,IL,IP,N,ITEM,IDEL(51),BMAX(15)
245      FILENAME INP
247      IF(IBC)1,1,100
249    1 IF(ISWTCH(5).NE.0)GO TO 3
251      PRINT 750
253    2 INPUT,ISWTCH(5)
255    3 IF(ISWTCH(5).EQ.1)GO TO 5
257      IF(ISWTCH(5).EQ.2)GO TO 6
259      IER=6 ; CALL ERROR
261      GO TO 2
263    5 INP="BASCAS"
265      GO TO 10
267    6 INP="NFOBASCA"
321   10 OPENFILE INP
341      REWIND INP
361      READ(INP,700)NO,NYES,ICOMMA,IBLANK
381      READ(INP,701)IL,BMAX
401      READ(INP,701)IL,NPH
421      IF(NPH)90,90,20
441   20 IF(NPH-25)30,30,90
461   30 DO 40 I=1,NPH
481      READ(INP,703)(NAME(I,J),J=1,3),(NPLA(I,J),J=1,3),
501     &(NFUEL(I,J),J=1,3),(NACD(I,J),J=1,3)
521      READ(INP,701)IL,NAC(I),NAD(I)
541      READ(INP,701)IL,ATP(I),WK(I),TOD(I)
561      READ(INP,701)IL,(WX(I,J),J=1,3)
581      READ(INP,701)IL,(GAS(I,J),J=1,3)
601      READ(INP,701)IL,(AU(I,J),J=1,3)
621      READ(INP,701)IL,(FU(I,J),J=1,3)
641      READ(INP,701)IL,(SFH(I,J),J=1,3)
661      READ(INP,701)IL,(FIH(I,J),J=1,3)
681      READ(INP,701)IL,(FTR(I,J),J=1,3)
701      READ(INP,701)IL,(FSO(I,J),J=1,3)
721      READ(INP,701)IL,(AMO(I,J),J=1,3)
741      READ(INP,701)IL,(ASH(I,J),J=1,3)
761      READ(INP,701)IL,(AIH(I,J),J=1,3)
781      READ(INP,701)IL,(AITR(I,J),J=1,3)
785      IF(ISWTCH(5).EQ.1)GO TO 38
```

TABLE 8.1 (Cont)

```
787C - - -READ NFO VALUES
789        READ(INP,701)IL,(FUN(I,J),J=1,3)
791        READ(INP,701)IL,(FIHN(I,J),J=1,3)
793        READ(INP,701)IL,(FTRN(I,J),J=1,3)
801     38 IPH=I
821        CALL CHECKP
841     40 CONTINUE
861        IF(NPH)90,90,49
862     49 IF(LEVLSR.EQ.1)GO TO 80
881     50 PRINT 705
901        CALL NOYES
921        IF(NY)80,80,60
941     60 CALL PHASES
961        KILL=0
981     80 CLOSEFILE INP
1001        IF(LEVLSR-2)87,87,83
1021    83 CALL MODIFY
1041    87 IF(ISWTCH(4).EQ.(-1))GO TO 89
1042       PRINT 760
1043       CALL NOYES
1045       IF(NY)89,89,88
1047    88 ISWTCH(4)=-1
1049       CHAIN"XLSR3*"
1051    89 CHAIN"XLSR2*"
1061    90 NPH=0
1081       IER=3
1101       CALL ERROR
1121       LEVLSR=4
1141       PRINT 706
1161       GO TO 80
1181   100 PRINT 707
1201       CALL NOYES
1221       IF(NY)110,110,105
1241   105 IBC=0
1261       GO TO 3
1281   110 INP="SAVBCS"
1301       GO TO 10
1321   700 FORMAT(5X,3A1,A4)
1341   701 FORMAT(V)
1361   703 FORMAT(5X,12A4)
1381   705 FORMAT(" PRINT LIST OF TRAINING PHASES (Y,N)")
1401   706 FORMAT(31H LSR COMPLEXITY OPTION SET TO 4)
1421   707 FORMAT(24H RESTORE BASE CASE (Y,N))
1425   750 FORMAT(" ENTER TRAINING FLOW NO."/
1426      &" 1 FOR PILOT, 2 FOR NFO. (X)")
1432   760 FORMAT(" TRY SIMPLE CONSTRAINTS (Y,N)")
1441       END
```

TABLE 8.1 (Cont)

a. Subroutine MODIFY

```
1461        SUBROUTINE MODIFY
1481        COMMON IYEAR,ISWTCH(10)
1501        COMMON NAME(25,3),NPLA(25,3),NFUEL(25,3),NACD(25,3),ATP(25),
1521       &WK(25),TOD(25),NAC(25),NAD(25),WX(25,3),GAS(25,3),AU(25,3),
1541       &FU(25,3),SFH(25,3),FIH(25,3),FTR(25,3),FSO(25,3),AMO(25,3),
1561       &ASH(25,3),AIH(25,3),AITR(25,3)
1571        COMMON FUN(25,3),FIHN(25,3),FTRN(25,3)
1581        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
1601       &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
1621        COMMON IBC,IL,IP,N,ITEM,IDEL(51),BMAX(15)
1641        FILENAME OUT
1661        OUT="SAVBCS"
1681        IS=0
1701        IF(NPH)90,90,10
1721     10 PRINT 700
1741        CALL NOYES
1761        IF(NY)120,120,20
1781     20 PRINT 701
1801        CALL NOYES
1821        IF(NY)40,40,30
1841     30 CALL DELETE
1861     40 PRINT 702
1881        CALL NOYES
1901        IF(NY)50,50,70
1921     50 IF(NPH)60,60,100
1941     60 IER=3
1961        NPH=0
1981        CALL ERROR
2001     70 IF(NPH-25)90,80,80
2021     80 IER=4
2041        CALL ERROR
2061        GO TO 20
2081     90 NPH=NPH+1
2101        IPH=NPH
2121        IS=1
2141        CALL NEWPHA
2161        GO TO 40
2181    100 IF(IS)120,120,110
2201    110 CALL PHASES
2221    120 PRINT 715
2241        CALL NOYES
2261        IF(NY)500,500,125
2281    125 PRINT 703
2301        CALL NOYES
```

TABLE 8.1 (Cont)

a. Subroutine MODIFY (Cont)

```
2321        IF(NY)180,180,130
2341   130  CALL EDIT1
2361        IF(N)150,150,160
2381   150  IER=2
2401        CALL ERROR
2421        GO TO 180
2441   160  DO 170 I=1,N,2
2461        IPH=IDEL(I)
2481        DO 170 J=1,22
2501        IL=J-1
2521        CALL LIST
2541   170  CONTINUE
2561   180  PRINT 704
2581        CALL NOYES
2601        IF(NY)120,120,190
2621   190  PRINT 705
2641   200  INPUT 706,IPH,IC1,IL,IC2,IP
2661        IF(IPH)210,120,220
2681   210  IER=6
2701   215  CALL ERROR
2721        GO TO 200
2741   220  IF(IPH-NPH)230,230,210
2761   230  IF(IC1-ICOMMA)240,250,240
2781   240  IER=1
2801        GO TO 215
2821   250  IF(IL)210,210,260
2841   260  IF(IL-5)270,290,330
2861   270  CALL UPDATE
2881        CALL LIST
2901   280  PRINT 707
2921        GO TO 200
2941   290  K=NAC(IPH)
2961        ILB=7
2981        IUB=17
3001        CALL UPDATE
3021        CALL LIST
3041        N=NAC(IPH)
3061   300  IF(K-N)310,280,280
3081   310  K=K+1
3101        DO 325 I=ILB,IUB
3121        IL=I
3141        DO 320 J=K,N
3161        IP=J
```

TABLE 8.1 (Cont)

a. Subroutine MODIFY (Cont)

```
3181   320 CALL UPDATE
3201   325 CALL LIST
3221       GO TO 280
3241   330 IF(IL-6)340,340,350
3261   340 K=NAD(IPH)
3281       ILB=18
3301       IUB=21
3321       CALL UPDATE
3341       CALL LIST
3361       N=NAD(IPH)
3381       GO TO 300
3401   350 N=NAC(IPH)
3421       IF(IL-17)360,360,390
3441   360 IF(IP)210,210,380
3461   380 IF(IP-N)270,270,210
3481   390 N=NAD(IPH)
3501       IF(IL-21)360,360,210
3521   500 DO 510 I=1,NPH
3541       IPH=I
3561   510 CALL CHECKP
3581       IF(NPH)90,90,530
3601   530 PRINT 708
3621       CALL NOYES
3641       IF(NY)560,560,540
3661   540 IBC=1
3681       OPENFILE OUT
3701       REWIND OUT
3721       WRITE(OUT,709)NO,NYES,ICOMMA,IBLANK
3741       WRITE(OUT,710)BMAX
3761       WRITE(OUT,711)NPH
3781       IC=1025
3801       DO 550 I=1,NPH
3821       IC=IC+5
3841       WRITE(OUT,712)IC,(NAME(I,J),J=1,3),(NPLA(I,J),J=1,3),
3861      &(NFUEL(I,J),J=1,3),(NACD(I,J),J=1,3)
3881       IC=IC+5
3901       WRITE(OUT,713)IC,NAC(I),NAD(I)
3921       IC=IC+5
3941       WRITE(OUT,714)IC,ATP(I),WK(I),TOD(I)
3961       IC=IC+5
3981       WRITE(OUT,714)IC,(WX(I,J),J=1,3)
4001       IC=IC+5
4021       WRITE(OUT,714)IC,(GAS(I,J),J=1,3)
```

TABLE 8.1 (Cont)

a. Subroutine MODIFY (Cont)

```
4041        IC=IC+5
4061        WRITE(OUT,714)IC,(AU(I,J),J=1,3)
4081        IC=IC+5
4101        WRITE(OUT,714)IC,(FU(I,J),J=1,3)
4121        IC=IC+5
4141        WRITE(OUT,714)IC,(SFH(I,J),J=1,3)
4161        IC=IC+5
4181        WRITE(OUT,714)IC,(FIH(I,J),J=1,3)
4201        IC=IC+5
4221        WRITE(OUT,714)IC,(FTR(I,J),J=1,3)
4241        IC=IC+5
4261        WRITE(OUT,714)IC,(FSO(I,J),J=1,3)
4281        IC=IC+5
4301        WRITE(OUT,714)IC,(AMO(I,J),J=1,3)
4321        IC=IC+5
4341        WRITE(OUT,714)IC,(ASH(I,J),J=1,3)
4361        IC=IC+5
4381        WRITE(OUT,714)IC,(AIH(I,J),J=1,3)
4401        IC=IC+5
4421        WRITE(OUT,714)IC,(AITR(I,J),J=1,3)
4441   550  CONTINUE
4461        CLOSEFILE OUT
4481   560  RETURN
4501   700  FORMAT(//33H ANY DELETIONS OR ADDITIONS (Y,N))
4541   701  FORMAT(20H ANY DELETIONS (Y,N))
4561   702  FORMAT(22H ADD A NEW PHASE (Y,N))
4581   703  FORMAT(21H ANY DATA LISTS (Y,N))
4601   704  FORMAT(24H ANY MODIFICATIONS (Y,N))
4621   705  FORMAT(41H ENTER PHASE, FIELD AND ELEMENT (XX,XX,X)/44H PHASE
4641      & = 00 IMPLIES NO FURTHER MODIFICATIONS/" NOTE TWO DIGIT
4661      &FIELDS MUST CONTAIN TWO DIGITS")
4681   706  FORMAT(2(I2,A1),I1)
4701   707  FORMAT(5H NEXT)
4721   708  FORMAT(30H SAVE MODIFIED DATA BASE (Y,N))
4741   709  FORMAT(5H1000 ,3A1,A4)
4761   710  FORMAT(5H1005 ,4E13.6/5H1010 ,4E13.6/5H1015 ,4E13.6/
4781      &5H1020 ,4E13.6)
4801   711  FORMAT(5H1025 ,I3)
4821   712  FORMAT(I4,1X,12A4)
4841   713  FORMAT(I4,1X,2I3)
4861   714  FORMAT(I4,1X,3E13.6)
4881   715  FORMAT(" ANY LISTS OR MODIFICATIONS (Y,N)")
4901        END
```

TABLE 8.1 (Cont)

b. Subroutine CHECKP

```
4921        SUBROUTINE CHECKP
4941        COMMON IYEAR,ISWTCH(10)
4961        COMMON IAD(25,3,4),DF1(25,3),NAC(25),NAD(25),DF2(25,3,12)
4971        COMMON DF3(25,3,3)
4981        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
5001       &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
5021        COMMON IBC,IL,IP,N,ITEM,IDEL(51),BMAX(15)
5041        DO 20 I=1,3
5061        IL=I-1
5081        ITEM=I
5101        FID=DF1(IPH,I)
5121        CALL DTEST
5141     20 DF1(IPH,I)=FID
5161        N=NAC(IPH)
5181        IF(N)40,80,30
5201     30 IF(N-3)50,50,40
5221     40 IL=0
5241        CALL LIST
5261        IL=5
5281        CALL LIST
5301        NAC(IPH)=0
5321        IER=5
5341        CALL ERROR
5361        GO TO 80
5381     50 DO 70 I=1,9
5401        IL=8+I
5421        ITEM=3+I
5441        DO 70 J=1,N
5461        FID=DF2(IPH,J,I)
5481        CALL DTEST
5501     70 DF2(IPH,J,I)=FID
5521     80 N=NAD(IPH)
5541        IF(N)100,140,90
5561     90 IF(N-3)110,110,100
5581    100 IL=0
5601        CALL LIST
5621        IL=6
5641        CALL LIST
5661        NAD(IPH)=0
5681        IER=5
5701        CALL ERROR
5721        GO TO 140
5741    110 DO 130 I=10,12
5761        IL=9+I
5781        ITEM=3+I
5801        DO 130 J=1,N
5821        FID=DF2(IPH,J,I)
5841        CALL DTEST
5861    130 DF2(IPH,J,I)=FID
5881    140 RETURN
5901        END
```

TABLE 8.1 (Cont)

c. Subroutine NOYES

```
5921        SUBROUTINE NOYES
5941        COMMON IYEAR,ISWITCH(10)
5961        COMMON NAME(25,3),NPLA(25,3),NFUEL(25,3),NACD(25,3),ATP(25),
5981       &WK(25),TOD(25),NAC(25),NAD(25),WX(25,3),GAS(25,3),AU(25,3),
6001       &FU(25,3),SFH(25,3),FIH(25,3),FTR(25,3),FSO(25,3),AMO(25,3),
6021       &ASH(25,3),AIH(25,3),AITR(25,3)
6031        COMMON DF3(25,3,3)
6041        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
6061       &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
6081        COMMON IBC,IL,IP,N,ITEM,IDEL(51),BMAX(15)
6101     10 I=1
6121        INPUT 700,NY
6141        IF(NO-NY)30,20,30
6161     20 NY=-1*I
6181        RETURN
6201     30 I=-1
6221        IF(NYES-NY)40,20,40
6241     40 IER=6
6261        CALL ERROR
6281        GO TO 10
6301    700 FORMAT(A1)
6321        END
```

TABLE 8.1 (Cont)

d. Subroutine DELETE

```
6341        SUBROUTINE DELETE
6361        COMMON IYEAR,ISWTCH(10)
6381        COMMON NAME(25,3),IAD(25,3,3),DF1(25,3),IDF1(25,2),
6401       &DF2(25,3,12),DF3(25,3,3)
6421        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
6441       &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
6461        COMMON IBC,IL,IP,N,ITEM,IDEL(51),BMAX(15)
6481        CALL EDIT1
6501        IF(N)10,10,20
6521    10  IER=2
6541        CALL ERROR
6561        GO TO 150
6581    20  M=NPH
6601        DO 140 I=1,M
6621        IPH=M+1-I
6641        DO 30 J=1,N,2
6661        IF(IPH-IDEL(J))30,40,30
6681    30  CONTINUE
6701        GO TO 140
6721    40  PRINT 700,IPH,(NAME(IPH,J),J=1,3)
6741        KILL=KILL+1
6761        KILLS(KILL)=IPH
6781        IF(IPH-NPH)50,100,100
6801    50  NPH1=NPH-1
6821        DO 90 K=IPH,NPH1
6841        KK=K+1
6861        DO 60 J=1,3
6881        NAME(K,J)=NAME(KK,J)
6901        DO 60 L=1,3
6921    60  IAD(K,J,L)=IAD(KK,J,L)
6941        DO 70 L=1,3
6961    70  DF1(K,L)=DF1(KK,L)
6981        DO 80 L=1,2
7001    80  IDF1(K,L)=IDF1(KK,L)
7021        DO 90 L=1,12
7041        DO 90 J=1,3
7061    90  DF2(K,J,L)=DF2(KK,J,L)
7081   100  NPH=NPH-1
7101   140  CONTINUE
7121        CALL PHASES
7141   150  RETURN
7161   700  FORMAT(13H DELETE PHASE,I3,1X,3A4)
7181        END
```

TABLE 8.1 (Cont)

e. Subroutine NEWPHA

```
7201        SUBROUTINE NEWPHA
7221        COMMON IYEAR,ISWTCH(10)
7241        COMMON NAME(25,3),NPLA(25,3),NFUEL(25,3),NACD(25,3),ATP(25),
7261       &WK(25),TOD(25),NAC(25),NAD(25),WX(25,3),GAS(25,3),AU(25,3),
7281       &FU(25,3),SFH(25,3),FIH(25,3),FTR(25,3),FSO(25,3),AMO(25,3),
7301       &ASH(25,3),AIH(25,3),AITR(25,3)
7311        COMMON DF3(25,3,3)
7321        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
7341       &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
7361        COMMON IBC,IL,IP,N,ITEM,IDEL(51),BMAX(15)
7365        ALPHA NPLA,NFUEL,NACD
7367        DO 5 I=1,3
7368        NPLA(IPH,I)="     "
7369        NFUEL(IPH,I)="     "
7370    5   NACD(IPH,I)="     "
7381        DO 10 I=1,6
7401        IL=I
7421        CALL UPDATE
7441   10   CONTINUE
7461        N=NAC(IPH)
7481        IF(N)40,40,20
7501   20   DO 30 I=7,17
7521        IL=I
7541        DO 30 J=1,N
7561        IP=J
7581        CALL UPDATE
7601   30   CONTINUE
7621   40   N=NAD(IPH)
7641        IF(N)70,70,50
7661   50   DO 60 I=18,21
7681        IL=I
7701        DO 60 J=1,N
7721        IP=J
7741        CALL UPDATE
7761   60   CONTINUE
7781   70   DO 80 I=1,22
7801        IL=I-1
7821        CALL LIST
7841   80   CONTINUE
7861        RETURN
7881        END
```

TABLE 8.1 (Cont)

f. Subroutine EDIT1

```
7901        SUBROUTINE EDIT1
7921        COMMON IYEAR,ISWTCH(10)
7941        COMMON NAME(25,3),NPLA(25,3),NFUEL(25,3),NACD(25,3),ATP(25),
7961       &WK(25),TOD(25),NAC(25),NAD(25),WX(25,3),GAS(25,3),AU(25,3),
7981       &FU(25,3),SFH(25,3),FIH(25,3),FTR(25,3),FSO(25,3),AMO(25,3),
8001       &ASH(25,3),AIH(25,3),AITR(25,3)
8011        COMMON DF3(25,3,3)
8021        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
8041       &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
8061        COMMON IBC,IL,IP,N,ITEM,IDEL(51),BMAX(15)
8081        PRINT 700
8101     10 INPUT 701,IDEL
8121        IDEL(51)=0
8141        DO 80 I=1,25
8161        N=2*I-1
8181        IF(IDEL(N))30,90,20
8201     20 IF(IDEL(N)-NPH)50,50,30
8221     30 IER=6
8241     40 CALL ERROR
8261        GO TO 10
8281     50 IF(I-1)80,80,60
8301     60 IF(IDEL(N-1)-ICOMMA)70,80,70
8321     70 IER=1
8341        GO TO 40
8361     80 CONTINUE
8381     90 N=N-2
8401        RETURN
8421    700 FORMAT(" ENTER PHASE NUMBERS (XX,XX, . .)"/" TWO
8441       &DIGITS ARE REQUIRED FOR EACH PHASE"/)
8461    701 FORMAT(25(I2,A1),I2)
8481        END
```

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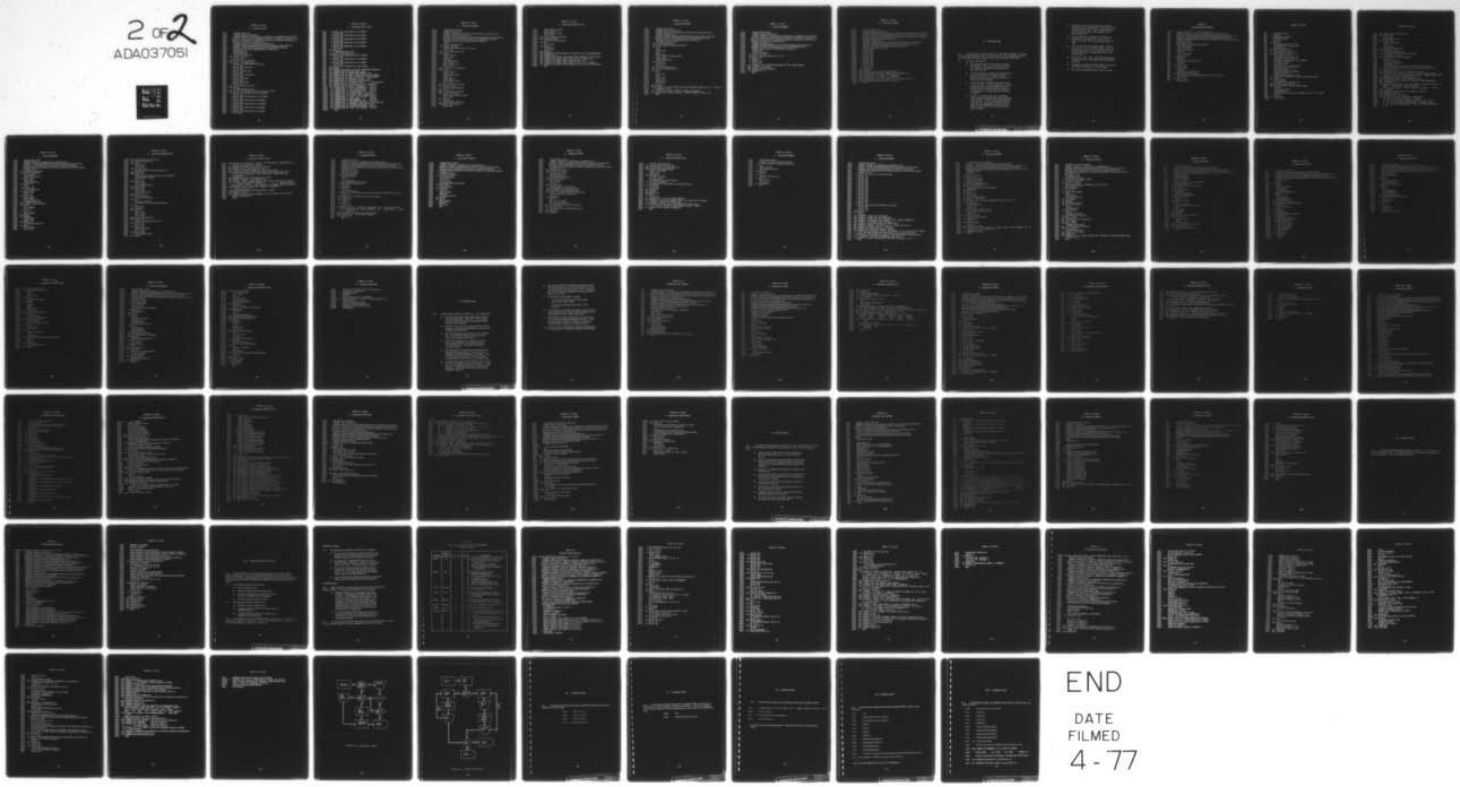

END

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TABLE 8.1 (Cont)

g. Subroutine LIST

```
8501       SUBROUTINE LIST
8521       COMMON IYEAR,ISWTCH(10)
8541       COMMON NAME(25,3),NPLA(25,3),NFUEL(25,3),NACD(25,3),ATP(25),
8561      &WK(25),TOD(25),NAC(25),NAD(25),WX(25,3),GAS(25,3),AU(25,3),
8581      &FU(25,3),SFH(25,3),FIH(25,3),FTR(25,3),FSO(25,3),AMO(25,3),
8601      &ASH(25,3),AIH(25,3),AITR(25,3)
8611       COMMON FUN(25,3),FIHN(25,3),FTRN(25,3)
8621       COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
8641      &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
8661       COMMON IBC,IL,IP,N,ITEM,IDEL(51),BMAX(15)
8681       NACC=NAC(IPH)
8701       NADD=NAD(IPH)
8721       IF(IL)100,100,110
8741   100 PRINT 700,IPH
8761       GO TO 200
8781   110 IF(IL-7)120,140,130
8801   120 GO TO (1,2,3,4,5,6),IL
8821     1 PRINT 701,(NAME(IPH,J),J=1,3)
8841       GO TO 200
8861     2 PRINT 702,ATP(IPH)
8881       GO TO 200
8901     3 PRINT 703,WK(IPH)
8921       GO TO 200
8941     4 PRINT 704, TOD(IPH)
8961       GO TO 200
8981     5 PRINT 705,NACC
9001       GO TO 200
9021     6 PRINT 706,NADD
9041       GO TO 200
9061   130 IF(IL-17)140,140,160
9081   140 K=IL-6
9101       IF(NACC)200,200,150
9121   150 GO TO (7,8,9,10,11,12,13,14,15,16,17),K
9141     7 PRINT 707,(NPLA(IPH,J),J=1,NACC)
9161       GO TO 200
9181     8 PRINT 708,(NFUEL(IPH,J),J=1,NACC)
9201       GO TO 200
9221     9 PRINT 709,(WX(IPH,J),J=1,NACC)
9241       GO TO 200
9261    10 PRINT 710,(GAS(IPH,J),J=1,NACC)
9281       GO TO 200
9301    11 PRINT 711,(AU(IPH,J),J=1,NACC)
9321       GO TO 200
9341    12 PRINT 712,(FU(IPH,J),J=1,NACC)
9361       GO TO 200
```

TABLE 8.1 (Cont)

g. Subroutine LIST (Cont)

```
9381    13 PRINT 713,(SFH(IPH,J),J=1,NACC)
9401       GO TO 200
9421    14 PRINT 714,(FIH(IPH,J),J=1,NACC)
9441       GO TO 200
9461    15 PRINT 715,(FTR(IPH,J),J=1,NACC)
9481       GO TO 200
9501    16 PRINT 716,(FSO(IPH,J),J=1,NACC)
9521       GO TO 200
9541    17 PRINT 717,(AMO(IPH,J),J=1,NACC)
9561       GO TO 200
9581   160 K=IL-17
9601       IF(NADD)200,200,170
9621   170 GO TO (18,19,20,21),K
9641    18 PRINT 718,(NACD(IPH,J),J=1,NADD)
9661       GO TO 200
9681    19 PRINT 719,(ASH(IPH,J),J=1,NADD)
9701       GO TO 200
9721    20 PRINT 720,(AIH(IPH,J),J=1,NADD)
9741       GO TO 200
9761    21 PRINT 721,(AITR(IPH,J),J=1,NADD)
9781   200 RETURN
9801   700 FORMAT(/29H DATA LIST FOR TRAINING PHASE,I3)
9821   701 FORMAT(15H 01 PHASE NAME ,3A4)
9841   702 FORMAT(19H 02 ATTRITION POINT,F7.4)
9861   703 FORMAT(18H 03 PHASE DURATION,F6.2,6H WEEKS)
9881   704 FORMAT(16H 04 TOUR OF DUTY,F6.2,7H MONTHS)
9901   705 FORMAT(21H 05 AIRCRAFT TYPES   ,I2)
9921   706 FORMAT(21H 06 INSTRUCTION TYPES,I2)
9941   707 FORMAT(24H 07 AIRCRAFT TYPES      ,3(1X,A4,2X))
9961   708 FORMAT(13H 08 FUEL TYPE,11X,3(1X,A4,2X))
9981   709 FORMAT(23H 09 FLYABLE WEATHER    ,3F7.3)
10001  710 FORMAT(22H 10 FUEL CONSUMPTION  ,3F7.2)
10021  711 FORMAT(22H 11 A/C UTILIZATION   ,3F7.2)
10041  712 FORMAT(22H 12 INSTRUCTOR UTIL.  ,3F7.2)
10061  713 FORMAT(17H 13 FLIGHT HOURS ,5X,3F7.2)
10081  714 FORMAT(22H 14 FLIGHT INST. HOURS,3F7.2)
10101  715 FORMAT(22H 15 INST. TR. PERIOD  ,3F7.2)
10121  716 FORMAT(22H 16 LSO RATIO         ,3F7.2)
10141  717 FORMAT(22H 17 MAINTENANCE MEN   ,3F7.2)
10161  718 FORMAT(23H 18 ACADEMIC INSTRUCT. ,3(2X,A4,1X))
10181  719 FORMAT(17H 19 STUDENT HOURS,5X,3F7.2)
10201  720 FORMAT(22H 20 INSTRUCTOR HOURS  ,3F7.2)
10221  721 FORMAT(22H 21 INST. TR. PERIOD  ,3F7.2)
10241      END
```

TABLE 8.1 (Cont)

h. Subroutine UPDATE

```
10261       SUBROUTINE UPDATE
10281       COMMON SWITCH(11)
10301       COMMON NAME(25,3),IAD(25,3,3),DF1(25,3),IDF1(25,2),
10321      &DF2(25,3,12),DF3(25,3,3)
10341       COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
10361      &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
10381       COMMON IBC,IL,IP,N,ITEM,IDEL(51),BMAX(15)
10401       IER=0
10421       IF(IL-1)20,20,130
10441    20 PRINT 700,IPH
10461       INPUT 701,(NAME(IPH,J),J=1,3)
10481       GO TO 500
10501   130 IF(IL-4)140,140,170
10521   140 K=IL-1
10541       PRINT 704,IL
10561       INPUT,FID
10581       ITEM=K
10601       DF1(IPH,K)=FID
10621       CALL DTEST
10641       DF1(IPH,K)=FID
10661       GO TO 500
10681   170 IF(IL-6)180,180,200
10701   180 K=IL-4
10721       PRINT 706,IL
10741       INPUT,IID
10761       IDF1(IPH,K)=IID
10781       ITEM=16
10801       CALL DTEST
10821       IDF1(IPH,K)=IID
10841       GO TO 500
10861   200 IF(IL-17)210,210,310
10881   210 N=IDF1(IPH,1)
10901       IF(IL-8)220,220,260
10921   220 K=IL-6
10941   230 IF(IP-N)250,250,500
10961   250 PRINT 707,IL,IP
10981       INPUT 701,IAD(IPH,IP,K)
11001       GO TO 500
11021   260 K=IL-8
11041       ITEM=IL-5
11061   270 IF(IP-N)280,280,500
11081   280 PRINT 709,IL,IP
11101       INPUT,FID
```

TABLE 8.1 (Cont)

h. Subroutine UPDATE (Cont)

```
11121       DF2(IPH,IP,K)=FID
11141       CALL DTEST
11161       DF2(IPH,IP,K)=FID
11181       GO TO 500
11201   310 IF(IL-21)320,320,500
11221   320 N=IDF1(IPH,2)
11241       IF(IL-18)340,330,340
11261   330 K=3
11281       GO TO 230
11301   340 K=IL-9
11321       ITEM=IL-6
11341       GO TO 270
11361   500 RETURN
11381   700 FORMAT(20H ENTER NAME OF PHASE,I3,15H (AAAAAAAAAAAA))
11401   701 FORMAT(3A4)
11421   702 FORMAT(41H ENTER FOLLOWING PHASE NUMBERS (XX,XX,XX))
11441   704 FORMAT(17H ENTER DATA FIELD,I3,10H (XXXX.XX))
11461   706 FORMAT(17H ENTER DATA FIELD,I3,4H (X))
11481   707 FORMAT(17H ENTER DATA FIELD,I3,1H-,I1,7H (AAAA))
11501   709 FORMAT(17H ENTER DATA FIELD,I3,1H-,I1,11H (XXX.XXXX))
11521       END
```

TABLE 8.1 (Cont)

i. Subroutine DTEST

```
11541       SUBROUTINE DTEST
11561       COMMON IYEAR,ISWTCH(10)
11581       COMMON IAD(25,3,4),DF1(25,3),IDF1(25,2),DF2(25,3,12)
11591       COMMON DF3(25,3,3)
11601       COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
11621      &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
11641       COMMON IBC,IL,IP,N,ITEM,IDEL(51),BMAX(15)
11661       IF(ITEM-16)50,90,500
11681    50 IF(FID)70,500,60
11701    60 IF(FID-BMAX(ITEM))500,500,70
11721    70 K=IL
11741       IL=0
11761       CALL LIST
11781       IL=K
11801       CALL LIST
11821       PRINT 700,FID,BMAX(ITEM)
11841       CALL NOYES
11861       IF(NY)80,80,500
11881    80 PRINT 701
11901       INPUT,FID
11921       GO TO 50
11941    90 IF(IID)110,500,100
11961   100 IF(IID-3)500,500,110
11981   110 K=IL
12001       IL=0
12021       CALL LIST
12041       IL=K
12061       CALL LIST
12081       PRINT 703
12101       INPUT,IID
12121       GO TO 90
12141   500 RETURN
12161   700 FORMAT(11H DATA POINT,F9.4,23H EXCEEDS RANGE OF 0.0 -,F9.4/13
12181      &H ACCEPT (Y,N))
12201   701 FORMAT(31H ENTER CORRECT VALUE (XXX.XXXX))
12221   703 FORMAT(40H INVALID VALUE - ENTER CORRECT VALUE (X))
12241       END
```

TABLE 8.1 (Cont)

j. Subroutine PHASES

```
12261       SUBROUTINE PHASES
12281       COMMON IYEAR,ISWTCH(10)
12301       COMMON NAME(25,3),NPLA(25,3),NFUEL(25,3),NACD(25,3),ATP(25),
12321      &WK(25),TOD(25),NAC(25),NAD(25),WX(25,3),GAS(25,3),AU(25,3),
12341      &FU(25,3),SFH(25,3),FIH(25,3),FTR(25,3),FSO(25,3),AMO(25,3),
12361      &ASH(25,3),AIH(25,3),AITR(25,3)
12371       COMMON DF3(25,3,3)
12381       COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
12401      &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
12421       COMMON IBC,IL,IP,N,ITEM,IDEL(51),BMAX(15)
12441       PRINT 700
12461       IF(NPH)40,40,10
12481    10 DO 20 I=1,NPH
12501    20 PRINT 701,I,(NAME(I,J),J=1,3)
12521    30 PRINT 703
12541       RETURN
12561    40 PRINT 702
12581       GO TO 30
12601   700 FORMAT(//16H TRAINING PHASES/15H NO. PHASE NAME)
12621   701 FORMAT(I3,2X,3A4)
12641   702 FORMAT(10H NO PHASES/)
12661   703 FORMAT(//" ")
12681       END
```

TABLE 8.1 (Cont)

k. Subroutine ERROR

```
12701       SUBROUTINE ERROR
12721       COMMON IYEAR,ISWTCH(10)
12741       COMMON NAME(25,3),NPLA(25,3),NFUEL(25,3),NACD(25,3),ATP(25),
12761      &WK(25),TOD(25),NAC(25),NAD(25),WM(25,3),GAS(25,3),AU(25,3),
12781      &FU(25,3),SFH(25,3),FIH(25,3),FTR(25,3),FSO(25,3),AMO(25,3),
12801      &ASH(25,3),AIH(25,3),AITR(25,3)
12811       COMMON DF3(25,3,3)
12821       COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
12841      &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
12861       COMMON IBC,IL,IP,N,ITEM,IDEL(51),BMAX(15)
12881       GO TO (2,3,4,5,6,7),IER
12901     2 PRINT 702
12921       GO TO 100
12941     3 PRINT 703
12961       GO TO 100
12981     4 PRINT 704
13001       GO TO 100
13021     5 PRINT 705
13041       GO TO 100
13061     6 PRINT 706
13081       GO TO 100
13101     7 PRINT 707
13121   100 RETURN
13141   702 FORMAT(21H COMMA MISSING REPEAT)
13161   703 FORMAT(30H PREVIOUS OPTION NOT PROCESSED)
13181   704 FORMAT(22H NO PHASES IN PIPELINE)
13201   705 FORMAT(22H 25 PHASES IN PIPELINE)
13221   706 FORMAT(37H MAX. FOR FIELD IS 3 - FIELD SET TO 0)
13241   707 FORMAT(22H INVALID DATA - REPEAT)
13261       END
```

# IX. PROGRAM LSR2

9.1 Program LSR2 is listed in Table 9.1. Additional changes in this section were made because of the new print options. Other changes were made to accommodate the NFO training system and the Dynamic IFRS entry.

9.2 The major changes are:

- NFO planning factors were added to common (225 words). This is seen in line 102 where the dimension on SPACE was changed from 25 x 50 to 25 x 59.
- To accommodate six following training phases from a given phase, all loops and statements that include the variables IPHASE and IDATA had to be modified.
- A new subroutine NFODYN was added (lines 13122 to 13302). Its main purpose is to open the proper (NFO or pilot) pipeline data file. It also sets the variable IDYN to indicate if the program is to transfer control to DYNAM* or XLSR3*.
- If this is a Dynamic IFRS run, the program merely reads the pipeline data file and checks it for validity. If it is a level of complexity 3 Dynamic run, the user can modify the pipelines and this modification will be saved in PIPES for later access by the Dynamic IFRS model in PTRS1.

- The user can now skip the printout of student information for each pipeline. (The instruction is printed in format 800.) This is handled in subroutine PIPENT with the new argument IDLET (line number 662).
- Program LSR2 now calculates the student load and prints it (see lines 1343, 1344, 1362, 1562, and 1563). This was previously done in LSR3.
- Line 723 now sets the student output to zero if it is less than 0.8 for a given phase. This now lets the user enter 0.1 as a required PTR and no requirements will be calculated on this small student output.
- Lines 3462, 3582, 3583, and 5882 were changed to indicate that six following training phases are permitted.
- Changes to subroutine PIPENT (starts at line number 7202) allow options to control output.
- Line 11102 was deleted since it was not used.

TABLE 9.1

PROGRAM LSR2 LISTING

```
99C- - - LSR2M 8/19/70  - - DLSR2 12/03/70 - -
102       COMMON IYEAR,ISWTCH(10),NAME(25,3),SPACE(25,59)
122       COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
142      &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
162       COMMON NPHP,IPHASE(25,7),ATR(25),PNAME(3),IPRT,NPSW,LSOSW
182      &,IDATA(11),IC
202       FILENAME PIPE
205       CALL NFODYN(PIPE,ISWTCH,IDYN)
207       ISWTCH(4)=KILL
222       DO 3 I=2,10,2
242     3 IDATA(I)=ICOMMA
262       LSOSW=0
302       DO 10 I=1,NPH
322       TSOUT(I)=0.0
342    10 SI(I)=0.0
344       ISAVE=0
345       IF(LEVLSR.NE.1)GO TO 18
346       IPRT=-1
347       GO TO 40
362    18 PRINT 700
382       CALL NOYES
402       IPRT=NY
442       IF(LEVLSR-3)40,20,20
462    20 IF(IDYN.EQ.0)GO TO 25
464       IF( (IDYN.EQ.1).AND.(LEVLSR.EQ.3) )GO TO 30
466       GO TO 40
468    25 PRINT 708
482       CALL NOYES
```

TABLE 9.1 (Cont)

```
502       IF(NY)40,40,30
522    30 ISAVE=1
542       OPENFILE "PIPES"
562       REWIND "PIPES"
582       LI=1000
592    40 NPSW=1
602       IF(IDYN.EQ.1)GO TO 100
603       IF(LEVLSR.NE.1)PRINT 800
604       LEVT=LEVLSR
622   100 CALL PIPINP(PIPE)
642       IF(NPSW)200,100,110
645   110 IF(IDYN.EQ.1)GO TO 128
662       CALL PIPENT(IDLET)
663       IF(IDLET.EQ.2)GO TO 100
664       IF(IDLET.EQ.1)LEVLSR=1
682       IF(LEVLSR.NE.1)PRINT 701,PNAME
702       DO 120 I=1,NPHP
722       K=IPHASE(I,7)
723       IF(SO(K).LT.0.8)SO(K)=0.0
742       SIN=SO(K)/(1.0-ATR(K))
762       ATL=SIN-SO(K)
782       TSOUT(K)=TSOUT(K)+SO(K)
802       SI(K)=SI(K)+SIN
803       IF(LEVLSR.EQ.1)GO TO 120
804       PRINT 702,(NAME(K,J),J=1,3),SIN,SO(K),ATL
822   120 CONTINUE
823       LEVLSR=LEVT
842       IF(LEVLSR.NE.1)PRINT 707
862   128 IF(ISAVE)100,100,130
882   130 WRITE("PIPES",709)LI,NPHP,PNAME
902       LI=LI+5
922       DO 140 I=1,NPHP
942       K=IPHASE(I,7)
962       WRITE("PIPES",710)LI,(IPHASE(I,J),J=1,7),ATR(K)
982       KILL=0
1002   140 LI=LI+5
1022       GO TO 100
```

TABLE 9.1 (Cont)

```
1042  200 IF(LEVLSR-2)300,300,210
1062  210 PRINT 703
1082      CALL NOYES
1102      IF(NY)300,300,220
1122  220 PRINT 704
1142      INPUT 705,PNAME
1162      NPHP=0
1182      CALL MPIPE
1202      IF(NPHP)210,210,110
1222  300 CLOSEFILE PIPE
1242      IF(ISAVE)320,320,310
1262  310 WRITE("PIPES",709)LI,NPSW,PNAME
1282      CLOSEFILE "PIPES"
1302  320 IF(IDYN.EQ.1)CHAIN"DYNAM*"
1312      PRINT 706
1322      DO 400 I=1,NPH
1342      ATL=SI(I)-TSOUT(I)
1343      A=SPACE(I,10)
1344      SL=(SI(I)*A+TSOUT(I)*(1.-A))*SPACE(I,11)/WPY
1362  400 PRINT 702,(NAME(I,J),J=1,3),SI(I),TSOUT(I),ATL,SL
1382      CHAIN"XLSR3*"
1402  700 FORMAT(26H PRINT ALL PIPELINES (Y,N))
1422  701 FORMAT(//5X,"STUDENT TYPE: ",3A4//18X,22H.STUDENT   ST
1442     &ATISTICS./40H TRAINING PHASE   INPUT  OUTPUT ATTRITES/)
1462  702 FORMAT(1X,3A4,F10.0,2F8.0,F10.1)
1482  703 FORMAT(25H ADD A NEW PIPELINE (Y,N))
1502  704 FORMAT(38H ENTER NAME OF PIPELINE (AAAAAAAAAAAA))
1522  705 FORMAT(3A4)
1542  706 FORMAT(//5X,"TOTAL FOR ALL STUDENT TYPES"//18X,22H.STU
1562     &DENT   STATISTICS.,4X,"STUDENT"/
1563     &" TRAINING PHASE   INPUT  OUTPUT ATTRITES    LOAD")
1602  707 FORMAT(//)
1622  708 FORMAT(" SAVE MODIFIED PIPELINES (Y,N)")
1642  709 FORMAT(2I4,3A4)
1662  710 FORMAT(I4,1X,7I3,F8.4)
1663  800 FORMAT(" FOR THE TRAINING PIPELINES"/
1664     &" AFTER ENTERING THE DATA - ENTER"/
1665     &" 0,0 FOR PIPELINE COMPUTATION AND PRINT OUT"/
1666     &" 0,1 FOR PIPELINE COMPUTATION - NO PRINT OUT"/
1667     &" 0,2 FOR NO COMPUTATION - SKIP TO NEXT PIPELINE")
1682      END
```

TABLE 9.1 (Cont)

a. Subroutine MPIPE

```
1702        SUBROUTINE MPIPE
1722        COMMON SWITCH(11),NAME(25,3),SPACE(25,59)
1742        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
1762       &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
1782        COMMON NPHP,IPHASE(25,7),ATR(25),PNAME(3),IPRT,NPSW,LSOSW
1802       &,IDATA(11),IC
1822     10 IF(NPHP)100,100,20
1842     20 PRINT 700,PNAME
1862        CALL NOYES
1882        IF(NY)500,500,30
1902     30 PRINT 701
1922        CALL NOYES
1942        IF(NY)50,50,40
1962     40 PRINT 711
1982        IID=1
2002     45 INPUT, IPH
2022        IF(IPH)50,50,46
2042     46 CALL DPIPE
2062        PRINT 710
2082        GO TO 45
2102     50 PRINT 702
2122        CALL NOYES
2142        IF(NY)60,60,70
2162     60 IF(NPHP)90,90,200
2182     70 IF(NPHP-NPH)110,80,80
2202     80 IER=5
2222        CALL ERROR
2242        GO TO 30
2262     90 IER=4
2282        CALL ERROR
2302    100 NPHP=0
2322    110 N=NPHP
2342        NPHP=NPHP+1
2362        PRINT 703
2382    120 INPUT,IPH
2402        IF(IPH)130,130,140
2422    130 IER=7
2442        CALL ERROR
2462        GO TO 120
```

TABLE 9.1 (Cont)

a. Subroutine MPIPE (Cont)

```
2482  140 IF(IPH-NPH)150,150,130
2502  150 IF(N)190,190,170
2522  160 IER=1
2542      CALL ERROR
2562      GO TO 50
2582  170 DO 180 I=1,N
2602      IF(IPHASE(I,7)-IPH)180,160,180
2622  180 CONTINUE
2642  190 PRINT 704
2662      INPUT,(IPHASE(NPHP,J),J=1,6),ATR(IPH)
2682      IPHASE(NPHP,7)=IPH
2702      GO TO 50
2722  200 PRINT 705
2742      CALL NOYES
2762      IF(NY)220,220,210
2782  210 CALL PIPRT
2802  220 PRINT 706
2822      CALL NOYES
2842      IF(NY)10,10,230
2862  230 PRINT 707
2882  240 INPUT,IPH,ISW
2902      IF(IPH)270,10,245
2922  245 N=0
2942      DO 260 I=1,NPHP
2962      IF(IPHASE(I,7)-IPH)260,250,260
2982  250 N=I
3002      GO TO 280
3022  260 CONTINUE
3042  270 IER=2
3062      CALL ERROR
3082      CALL PIPRT
3102      GO TO 240
3122  280 IF(ISW)270,290,310
3142  290 PRINT 708
3162      INPUT,(IPHASE(N,J),J=1,6)
3182  300 PRINT 710
3202      GO TO 240
3222  310 PRINT 709
3242      INPUT,ATR(IPH)
3262      GO TO 300
3282  500 CALL PIPER
3302      IF(NPHP)90,90,510
3322  510 RETURN
```

TABLE 9.1 (Cont)

a. Subroutine MPIPE (Cont)

```
3342   700 FORMAT(//" PIPELINE ",3A4,/" ANY DELETIONS, ADDITIONS, LI
3362      &STS OR MODIFICATIONS (Y,N)")
3382   701 FORMAT(24H DELETE ANY PHASES (Y,N))
3402   702 FORMAT(" ADD A NEW PHASE (Y,N)")
3422   703 FORMAT(31H ENTER NUMBER OF NEW PHASE (XX))
3442   704 FORMAT(42H ENTER FOLLOWING PHASES AND ATTRITION RATE/
3462      &" (XX,XX,XX,XX,XX,XX, .XXX) ALL DATA FIELDS MUST BE
3463      & ENTERED"//)
3482   705 FORMAT(25H LIST PIPELINE DATA (Y,N))
3502   706 FORMAT(" MODIFY A PIPLINE(Y,N)")
3522   707 FORMAT(" ENTER PHASE NUMBER AND SWITCH (XX,X)"/" SWITCH =
3542     & 0 - MODIFY FOLLOWING PHASES"/"         = 1 - MODIFY ATTRIT
3562      &ION RATE"/" PHASE  = 0,0 IMPLIES NO FURTHER MODIFICATIONS")
3582   708 FORMAT(" ENTER FOLLOWING PHASES (6 VALUES)"/
3583      &" (XX,XX,XX,...)")
3602   709 FORMAT(28H ENTER ATTRITION RATE (.XXX))
3622   710 FORMAT(5H NEXT)
3642   711 FORMAT(" ENTER PHASE NUMBERS (XX)"/" ENTER 0, FOR NO FU
3662      &RTHER DELETIONS")
3682       END
```

TABLE 9.1 (Cont)

b. Subroutine PIPRT

```
3702        SUBROUTINE PIPRT
3722        COMMON SWITCH(11),NAME(25,3),SPACE(25,59)
3742        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
3762       &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
3782        COMMON NPHP,IPHASE(25,7),ATR(25),PNAME(3),IPRT,NPSW,LSOSW
3802       &,IDATA(11),IC
3822        PRINT 700,PNAME
3842        IF(NPHP)80,80,10
3862    10  DO 60 K=1,NPHP
3882        I=IPHASE(K,7)
3902        IC=1
3922        DO  30 J=1,6
3942        IF(IPHASE(K,J))30,30,20
3962    20  IDATA(IC)=IPHASE(K,J)
3982        IC=IC+2
4002    30  CONTINUE
4022        IC=IC-2
4042        IF(IC)50,50,40
4062    40  PRINT 701,I,(NAME(I,J),J=1,3),ATR(I),(IDATA(J),J=1,IC)
4082        GO TO 60
4102    50  PRINT 701,I,(NAME(I,J),J=1,3),ATR(I)
4122    60  CONTINUE
4142    70  PRINT 703
4162        RETURN
4182    80  PRINT 702
4202        GO TO 70
4222   700  FORMAT(//27H  TRAINING  PIPELINE  FOR  ,3A4//6H PHASE,
4242       &13X,20HATTRITION  FOLLOWING/37H  NO.   PHASE NAME    RATE
4262       &     PHASES/)
4282   701  FORMAT(I4,4X,3A4,F7.4,I7,5(A1,I2)
4302   702  FORMAT(20H   NO CURRENT PHASES)
4322   703  FORMAT(1X)
4342        END
```

TABLE 9.1 (Cont)

c. Subroutine LOADSO

```
4362        SUBROUTINE LOADSO
4382        COMMON SWITCH(11),NAME(25,3),SPACE(25,59)
4402        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
4422       &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
4442        COMMON NPHP,IPHASE(25,7),ATR(25),PNAME(3),IPRT,NPSW,LSOSW
4462       &,IDATA(11),IC
4482        IF(NPHP)40,40,10
4502    10  DO 30 K=1,NPHP
4522        I=IPHASE(K,7)
4542        SO(I)=0.0
4562        DO 20 J=1,6
4582        IF(IPHASE(K,J))30,20,30
4602    20  CONTINUE
4622        SO(I)=-1000.
4642    30  CONTINUE
4662        LSOSW=1
4682        CALL OUTPUT
4702        LSOSW=0
4722        IF(IER)40,40,50
4742    40  RETURN
4762    50  IER=3
4782        CALL ERROR
4802        NPHP=0
4822        GO TO 40
4842        END
```

TABLE 9.1 (Cont)

d. Subroutine PIPER

```
4862        SUBROUTINE PIPER
4882        COMMON SWITCH(11),NAME(25,3),SPACE(25,59)
4902        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
4922       &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
4942        COMMON NPHP,IPHASE(25,7),ATR(25),PNAME(3),IPRT,NPSW,LSOSW
4962       &,IDATA(11),IC
4982     10 IF(NPHP)170,170,20
5002     20 DO 140 I=1,NPHP
5022        IPH=IPHASE(I,7)
5042        IF(IPH)40,40,30
5062     30 IF(IPH-NPH)50,50,40
5082     40 PRINT 700,IPH
5102        CALL DPIPE
5122        GO TO 10
5142     50 DO 90 J=1,6
5162        IF(IPHASE(I,J))80,90,60
5182     60 IF(IPHASE(I,J)-IPH)70,80,70
5202     70 IF(IPHASE(I,J)-NPH)90,90,80
5222     80 PRINT 701,IPH,(IPHASE(I,K),K=1,6)
5242        INPUT,(IPHASE(I,K),K=1,6)
5262        GO TO 20
5282     90 CONTINUE
5302        IC=0
5322        DO 130 K=1,NPHP
5342        IF(I-K)100,110,100
5362    100 IF(IPHASE(K,7)-IPH)110,40,110
5382    110 DO 130 J=1,6
5402        IF(IPHASE(K,J)-IPH)130,120,130
5422    120 IC=IC+1
5442    130 CONTINUE
```

TABLE 9.1 (Cont)

d. Subroutine PIPER (Cont)

```
5462        IF(IC-1)135,135,160
5482   135  IF(ATR(IPH))137,140,136
5502   136  IF(ATR(IPH)-1.0)140,137,137
5522   137  PRINT 702,IPH,ATR(IPH)
5542        INPUT, ATR(IPH)
5562        GO TO 135
5582   140  CONTINUE
5602        DO 143 I=1,NPHP
5622        DO 143 J=1,6
5642        IF(IPHASE(I,J))143,143,141
5662   141  DO 142 K=1,NPHP
5682        IF(IPHASE(K,7)-IPHASE(I,J))142,143,142
5702   142  CONTINUE
5722        GO TO 160
5742   143  CONTINUE
5762   150  RETURN
5782   160  PRINT 703
5802   170  NPHP=0
5822        GO TO 150
5842   700  FORMAT(I3," IS AN INVALID PHASE")
5862   701  FORMAT(" FOLLOWING PHASES FOR",I3,",ARE",3I3/" PLEASE
5882       & CORRECT (XX,XX,XX,XX,XX,XX)")
5902   702  FORMAT(" PHASE",I3," ATTRITION RATE OF",F8.4/
5922       &" IS INVALID RE-ENTER THE CORRECT VALUE (.XXX)")
5942   703  FORMAT(" ALL PHASES DELETED")
5962        END
```

TABLE 9.1 (Cont)

e. Subroutine NOYES

```
5982        SUBROUTINE NOYES
6002        COMMON SWITCH(11),DUMMY(25,62),
6022       &ICOMMA,IBLANK,NO,NYES,NY,NPH,IER
6102     10 I=1
6122        INPUT 700,NY
6142        IF(NO-NY)30,20,30
6162     20 NY=-1*I
6182        RETURN
6202     30 I=-1
6222        IF(NYES-NY)40,20,40
6242     40 IER=7
6262        CALL ERROR
6282        GO TO 10
6302    700 FORMAT(A1)
6322        END
```

TABLE 9.1 (Cont)

f. Subroutine ERROR

```
6342        SUBROUTINE ERROR
6362        COMMON SWITCH(11),NAME(25,3),SPACE(25,59)
6382        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
6402       &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
6422        COMMON NPHP,IPHASE(25,7),ATR(25),PNAME(3),IPRT,NPSW,LSOSW
6442       &,IDATA(11),IC
6462        GOTO (1,2,3,4,5,6,7,8,9,10),IER
6482      1 PRINT 701
6502        GO TO 100
6522      2 PRINT 702
6542        GO TO 100
6562      3 PRINT 703
6582        GO TO 100
6602      4 PRINT 704
6622        GO TO 100
6642      5 PRINT 705
6662        GO TO 100
6682      6 PRINT 706
6702        GO TO 100
6722      7 PRINT 707
6742        GO TO 100
6762      8 PRINT 708
6782        GO TO 100
6802      9 PRINT 709,IID,FID,(IDATA(J),J=1,IPH)
6822        PRINT 729
6842        GO TO 100
6862     10 PRINT 710
6882    100 IER=0
6902        RETURN
6922    701 FORMAT(" PHASE IN PIPELINE")
6942    702 FORMAT(" PHASE NOT IN PIPELINE")
6962    703 FORMAT(" PIPELINE LOGIC ERROR - ALL PHASES DELETED")
6982    704 FORMAT(" NO PHASES IN PIPELINE")
7002    705 FORMAT(" MAXIMUM PHASES IN PIPELINE")
7022    706 FORMAT(37H MAX. FOR FIELD IS 3 - FIELD SET TO 0)
7042    707 FORMAT(" INVALID REPLY - REPEAT")
7062    708 FORMAT(23H COMPUTER ERROR, RE-RUN)
7082    709 FORMAT(27H RESIDUAL OUTPUT FROM PHASE,I3,3H IS,F6.0,9H STUDEN
7102       &TS/" DIVIDED AMONG THE FOLLOWING PHASES",I3,5(A1,I2))
7122    710 FORMAT(" INSUFFICIENT DATA TO COMPUTE STUDENT STATISTICS"/
7142       &" RE-ENTER STUDENT ASSIGNMENTS OR RERUN")
7162    729 FORMAT(" ENTER APPROPRIATE MIX(XXX,XXX,XXX,...)"//)
7182        END
```

TABLE 9.1 (Cont)

g. Subroutine PIPENT

```
7202       SUBROUTINE PIPENT(IDLET)
7222       COMMON SWITCH(11),NAME(25,3),SPACE(25,59)
7242       COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
7262      &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
7282       COMMON NPHP,IPHASE(25,7),ATR(25),PNAME(3),IPRT,NPSW,LSOSW
7302      &,IDATA(11),IC
7303       IDLET=1
7322     5 DO 10 I=1,NPH
7342    10 SO(I)=0.0
7362       PRINT 702,PNAME
7382    20 INPUT,IPH,SOUT
7402       IF(IPH)60,90,30
7422    30 IF(IPH-NPH)40,40,60
7442    40 DO 50 I=1,NPHP
7462       IF(IPHASE(I,7)-IPH)50,70,50
7482    50 CONTINUE
7502    60 IER=2
7522    65 CALL ERROR
7542       GO TO 20
7562    70 IF(SOUT)72,75,80
7563    72 IER=7 ; GO TO 65
7564    75 PRINT," ZERO OUTPUT INVALID-RETYPE AS 0.01"
7565       GO TO 20
7582    80 SO(IPH)=-SOUT
7602       PRINT 703
7622       GO TO 20
7642    90 IF(SOUT.EQ.1)GO TO 92
7643       IF(SOUT.EQ.2)GO TO 125
7644       IDLET=0
7645    92 CALL OUTPUT
7662       IF(IER)120,120,100
7682   100 CALL ERROR
7702       GO TO 5
7722   120 CALL SMOOTH
7742       RETURN
7743   125 IDLET=2;RETURN
7782   702 FORMAT(//" FOR PIPELINE: ",3A4/" ENTER PHASE NUMBER AND ST
7802      &UDENT OUTPUT (XX,XXXX.)" )
7842   703 FORMAT("+NEXT")
7862       END
```

TABLE 9.1 (Cont)

h. Subroutine PIPINP

```
7882       SUBROUTINE PIPINP(PIPE)
7902       COMMON SWITCH(11),NAME(25,3),SPACE(25,59)
7922       COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
7942      &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
7962       COMMON NPHP,IPHASE(25,7),ATR(25),PNAME(3),IPRT,NPSW,LSOSW
7982      &,IDATA(11),IC
8002       FILENAME PIPE
8042       IF(NPSW)65,10,10
8062    10 READ(PIPE,700)NPHP,PNAME
8082       IF(NPHP)60,50,30
8102    30 DO 40 I=1,NPHP
8122       READ(PIPE,701)IL,(IPHASE(I,J),J=1,7),AT
8142       IPH=IPHASE(I,7)
8162    40 ATR(IPH)=AT
8182       GO TO 70
8202    50 PRINT 702,PNAME
8222       NPHP=0
8242       CALL NOYES
8262       IF(NY)60,60,120
8282    60 NPSW=NPHP
8302    65 RETURN
8322    70 IF(KILL)90,90,80
8342    80 DO 85 I=1,KILL
8362       IID=-1
8382       IPH=KILLS(I)
8402    85 CALL DPIPE
8422       IID=0
8442       IF(NPHP)50,50,90
8462    90 IF(IPRT)110,110,100
8482   100 CALL PIPRT
8502   110 IF(LEVLSR-2)130,130,120
8522   120 CALL MPIPE
8542   130 CALL PIPER
8562       IF(NPHP)50,50,140
8582   140 IF(NPHP-NPH)150,150,50
8602   150 CALL LOADSO
8622       IF(NPHP)50,50,60
8642   700 FORMAT(5X,I3,3A4)
8662   701 FORMAT(V)
8682   702 FORMAT(31H NO PHASES EXIST FOR PIPELINE -,3A4/21H ENTER NEW
8702      & DATA (Y,N))
8722       END
```

TABLE 9.1 (Cont)

i. Subroutine DPIPE

```
8742        SUBROUTINE DPIPE
8762        COMMON SWITCH(11),NAME(25,3),SPACE(25,59)
8782        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,NPY,
8802       &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
8822        COMMON NPHP,IPHASE(25,7),ATR(25),PNAME(3),IPRT,NPSW,LSOSW
8842       &,IDATA(11),IC
8862        IF(IPH)70,70,5
8882      5 DO 30 I=1,NPHP
8902        DO 30 J=1,7
8922        IF(IPHASE(I,J)-IPH)30,20,10
8942     10 IF(IID)15,30,30
8962     15 IPHASE(I,J)=IPHASE(I,J)-1
8982        GO TO 30
9002     20 IPHASE(I,J)=0
9022     30 CONTINUE
9042        IF(IID)40,70,70
9062     40 IF(IPH-25)50,70,70
9082     50 DO 60 I=IPH,24
9102        K=I+1
9122     60 ATR(I)=ATR(K)
9142     70 L=0
9162        DO 90 I=1,NPHP
9182        IF(IPHASE(I,7))80,80,90
9202     80 L=I
9222        GO TO 110
9242     90 CONTINUE
9262    100 RETURN
9282    110 IF(L-NPHP)120,140,140
9302    120 M=NPHP-1
9322        DO 130 I=L,M
9342        K=I+1
9362        DO 130 J=1,7
9382    130 IPHASE(I,J)=IPHASE(K,J)
9402    140 NPHP=NPHP-1
9422        IF(NPHP)100,100,70
9442        END
```

TABLE 9.1 (Cont)

j. Subroutine OUTPUT

```
9462        SUBROUTINE OUTPUT
9482        COMMON SWITCH(11),NAME(25,3),SPACE(25,59)
9502        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,NPY,
9522       &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
9542        COMMON NPHP,IPHASE(25,7),ATR(25),PNAME(3),IPRT,NPSW,LSOSW
9562       &,IDATA(11),IC
9582        IER=0
9602    10  ICK=0
9622        IALL=0
9642        DO 60 L=1,NPHP
9662        M=NPHP+1-L
9682        I=IPHASE(M,7)
9702        IF(SO(I))50,20,20
9722    20  TA=0.0
9742        DO 40 J=1,6
9762        K=IPHASE(M,J)
9782        IF(K)40,40,30
9802    30  IF(SO(K))35,60,60
9822    35  TA=TA+SO(K)/(1.0-ATR(K))
9842    40  CONTINUE
9862        IF(TA)45,60,60
9882    45  ICK=1
9902        SO(I)=TA
9922    50  IALL=IALL+1
9942        IF(IALL-NPHP)60,80,80
9962    60  CONTINUE
9982        IF(ICK)70,70,10
10002    70 IF(LSOSW)75,75,90
10022    75 CALL OUTFOR
10042       IF(NY)90,90,10
10062    80 DO 85 L=1,NPHP
10082       I=IPHASE(L,7)
10102    85 SO(I)=-SO(I)
10122       GO TO 100
10142    90 IER=10
10162   100 CONTINUE
10182       RETURN
10202       END
```

TABLE 9.1 (Cont)

k. Subroutine OUTFOR

```
10222       SUBROUTINE OUTFOR
10242       COMMON SWITCH(11),NAME(25,3),SPACE(25,59)
10262       COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,MPY,
10282      &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
10302       COMMON NPHP,IPHASE(25,7),ATR(25),PNAME(3),IPRT,NPSW,LSOSW
10322      &,IDATA(11),IC
10342       DIMENSION T(6)
10362       NY=0
10382    10 ICK=0
10402       DO 170 II=1,NPHP
10422       I=IPHASE(II,7)
10442       IF(SO(I))20,170,170
10462    20 TA=0.0
10482       IL=1
10502       DO 60 J=1,6
10522       K=IPHASE(II,J)
10542       IF(K)60,60,30
10562    30 IF(SO(K))40,50,50
10582    40 TA=TA+SO(K)/(1.0-ATR(K))
10602       GO TO 60
10622    50 IDATA(IL)=K
10642       IL=IL+2
10662       L=K
10682    60 CONTINUE
10702       A=SO(I)-TA
10722       IL=IL-2
10742       IF(IL-1)170,80,110
```

TABLE 9.1 (Cont)

k. Subroutine OUTFOR (Cont)

```
10762    80 IF(A)90,180,180
10782    90 SO(L)=A*(1.0-ATR(L))
10802       NY=1
10822       ICK=1
10842       GO TO 170
10862   110 A=-A
10882       IF(A)180,180,120
10902   120 IID=I
10922       IER=9
10942       IPH=IL
10962       FID=A
10982       CALL ERROR
11002       N=IL/2 + 1
11022   125 INPUT,(T(J),J=1,N)
11042       TOT=0.0
11062       DO 130 J=1,N
11082       IF(T(J))140,130,130
11122   130 TOT=TOT + T(J)
11142       R=ABS(TOT-A)
11162       IF(R-1.5)150,150,140
11182   140 IER=7
11202       CALL ERROR
11222       GO TO 125
11242   150 J=0
11262       DO 160 L=1,IL,2
11282       J=J+1
11302       K=IDATA(L)
11322   160 SO(K)=-T(J)*(1.0-ATR(K))*A/TOT
11342       ICK=1
11362       NY=1
11382   170 CONTINUE
11402       IF(ICK)180,180,10
11422   180 RETURN
11442       END
```

TABLE 9.1 (Cont)

1. Subroutine SMOOTH

```
11462       SUBROUTINE SMOOTH
11482       COMMON SWITCH(11),NAME(25,3),SPACE(25,59)
11502       COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,MPY,
11522      &AFD,KILL,IID,FID,KILLS(25),SI(25),TSOUT(25),SO(25)
11542       COMMON NPHP,IPHASE(25,7),ATR(25),PNAME(3),IPRT,NPSW,LSOSW
11562      &,IDATA(11),IC
11582       DIMENSION T(3)
11602     5 DO 20 L=1,NPHP
11622       I=IPHASE(L,7)
11642       DO 10 J=1,6
11662       IF(IPHASE(L,J))10,10,20
11682    10 CONTINUE
11702       SO(I)=-SO(I)
11722    20 CONTINUE
11742    30 ICK=0
11762       IALL=0
11782       DO 110 L=1,NPHP
11802       M=NPHP+1-L
11822       I=IPHASE(M,7)
11842       IF(SO(I))100,100,40
11862    40 TA=.01
11882       DO 70 J=1,6
11902       K=IPHASE(M,J)
11922       IF(K)70,70,50
11942    50 IF(SO(K))60,70,110
11962    60 TA=TA+SO(K)/(1.0-ATR(K))
11982    70 CONTINUE
12002       IF(SO(I)+TA)90,80,80
12022    80 SO(I)=TA-.01
12042       GO TO 100
12062    90 SO(I)=-SO(I)
12082       ICK=1
12102   100 IALL=IALL+1
12122   110 CONTINUE
12142       IF(IALL-NPHP)30,120,120
12162   120 DO 130 L=1,NPHP
12182       I=IPHASE(L,7)
12202   130 SO(I)=-SO(I)
12222       IF(ICK)140,140,150
12242   140 CONTINUE
12262       RETURN
```

TABLE 9.1 (Cont)

1. Subroutine SMOOTH (Cont)

```
12282  150 DO 300 II=1,NPHP
12302      I=IPHASE(II,7)
12322      TA= -.01
12342      IL=-1
12362      DO 170 J=1,6
12382      K=IPHASE(II,J)
12402      IF(K)170,170,160
12422  160 IL=IL+2
12442      IDATA(IL)=K
12462      TA=TA + SO(K)/(1.0-ATR(K))
12482  170 CONTINUE
12502      T(1)=1.0
12522      R=1.0
12542      IF(IL)300,300,180
12562  180 IF(SO(L)-TA)190,300,300
12582  190 IF(IL-1)300,250,195
12602  195 IID=L
12622      FID=SO(L)
12642      IER=9
12662      IPH=IL
12682      CALL ERROR
12702      N=IL/2 + 1
12722  200 INPUT,(T(I),I=1,N)
12742      R=0.0
12762      DO 240 I=1,N
12782      R=R+T(I)
12802      IF(T(I))280,240,240
12822  240 CONTINUE
12842      TA=ABS(R-SO(L))
12862      IF(TA-1.5)250,250,280
12882  250 I=0
12902      DO 260 J=1,IC,2
12922      I=I+1
12942      K=IDATA(J)
12962  260 SO(K)=T(I)*SO(L)*(1.0-ATR(K))/R
12982      GO TO 5
13002  280 IER=7
13022  290 CALL ERROR
13042      GO TO 200
13062  300 CONTINUE
13082      GO TO 5
13102      END
```

TABLE 9.1 (Cont)

m. Subroutine NFODYN

```
13122       SUBROUTINE NFODYN(PIPE,ISWTCH,IDYN)
13142       DIMENSION ISWTCH(10)
13162       FILENAME PIPE
13182       IDYN=0
13202       IF(ISWTCH(4).EQ.(-1))IDYN=1
13222C - -  IDYN=1 IMPLIES AN ENTRY FROM DYNAMIC IFRS
13232       K=ISWTCH(5)
13242       IF(K.EQ.1)PIPE="PIPE"
13262       IF(K.EQ.2)PIPE="NFOPIPE"
13282       OPENFILE PIPE; REWIND PIPE
13302       RETURN;END
```

# X. PROGRAM LSR3

10.1 Program LSR3 is listed in Table 10.1. The changes are:

- NFO planning factors were added to the common area of storage (e.g., line 185). Also line 264 contains a few extra words of temporary storage (variable FITN and FIN).
- Line 265 is a test for the simple constraint calculations. If they are to be performed, control goes to subroutine PRECONST.
- Line 863 now prints a partial title on the LSROUT file. The training system type (pilot or NFO) number and the date are printed.
- Lines 870 to 966 are new. There are now two loops calling GENLSR. The first loop prints out instructor data. The second loop prints out aircraft data.
- Note that lines 1276 and 1278 are comment lines that are part of the format. This is to let the academic instructor information be printed. Only a few changes are required to get this printed. It was printed in IFRS II but it is not printed now.
- Line 2003 now tests to see if there are any aircraft or academic instructor types in the phase. If there are not, the program then prints "Values not constraining." Previously the program would go to statement number 5.

- The argument SOUT was added to subroutine GENLSR. This was necessary to avoid modifying the SO array in common which was then used by LSR4. Previously the values of SO were modified by the LSR constraint option at line 2423.
- GENLSR has been modified to handle
  - The NFO calculations (lines 3744, 4285, 4302, 4362, 5365, 5366)
  - The new print changes (lines 4923, 5284 to 5924).
- If the academic instructor information is to be printed, the comment lines in GENLSR can be modified to get it printed (lines 5604, 5684, 5844-5884).
- PRECONST is the new subroutine to set up and print out the simple constraint calculation results. Once the options and values are entered, it calls subroutine CONST to compute the related values.
- Subroutine CONST calculates the related requirements by evaluating the appropriate algebraic relationships.

TABLE 10.1

PROGRAM LSR3 LISTING

```
      COMMON IYR,ISWTCH(10)
      COMMON NAME(25,3),NPLA(25,3),NFUEL(25,3),NACD(25,3),ATP(25),
     &WK(25),TOD(25),NAC(25),NAD(25),WX(25,3),GAS(25,3),AU(25,3),
     &FU(25,3),SFH(25,3),FIH(25,3),FTR(25,3),FSO(25,3),AMO(25,3),
     &ASH(25,3),AIH(25,3),AITR(25,3)
      COMMON FUN(25,3),FIHN(25,3),FTRN(25,3)
      COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
     &AFD,KILL,IID,FID,KILLS(25),SINP(25),SO(25)
      COMMON IACT(3),IAFT(3),IAIN(3),BF(3),FIT(3),FI(3),
     &FLSO(3),EM(3),AIT(3),ACNO(3),AI(3)
      COMMON FITN(3),FIN(3)
      IF(ISWTCH(4).EQ.(-1))CALL PRECONST
      IID=1000
      CALL LSTLSR
      IF(LEVLSR-2)30,20,10
   10 IF(LEVLSR-4)30,20,30
   20 CALL MODLSR
   30 IF(LEVLSR)50,50,40
   40 PRINT 700
      CALL NOYES
      IF(NY)60,60,70
   50 LEVLSR=-LEVLSR
   60 CHAIN"XLSR4*"
   70 CHAIN"XLSR1*"
  700 FORMAT(27H GENERATE ANOTHER LSR (Y,N))
      END
```

TABLE 10.1 (Cont)

a. Subroutine LSTLSR

```
563       SUBROUTINE LSTLSR
583       COMMON IYR,ISWTCH(10)
603       COMMON NAME(25,3),NPLA(25,3),NFUEL(25,3),NACD(25,3),ATP(25),
623      &WK(25),TOD(25),NAC(25),NAD(25),WX(25,3),GAS(25,3),AU(25,3),
643      &FU(25,3),SFH(25,3),FIH(25,3),FTR(25,3),FSO(25,3),AMO(25,3),
663      &ASH(25,3),AIH(25,3),AITR(25,3)
665       COMMON FUN(25,3),FIHN(25,3),FTRN(25,3)
683       COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
703      &AFD,KILL,IID,FID,KILLS(25),SINP(25),SO(25)
723       COMMON IACT(3),IAFT(3),IAIN(3),BF(3),FIT(3),FI(3),
743      &FLSO(3),EM(3),AIT(3),ACNO(3),AI(3)
744       COMMON FITN(3),FIN(3)
823       OPENFILE "LSROUT"
843       REWIND "LSROUT"
863       WRITE("LSROUT",703)NPH,ISWTCH(5),DAT(X)
870       NY=-10
871       PRINT 710
883       DO 10 I=1,NPH
903       IPH=I
923    10 CALL GENLSR(SO(I))
943       CLOSEFILE"LSROUT"
953       NY=-12
954       PRINT 712
964       DO 12 I=1,NPH
965       IPH=I
966    12 CALL GENLSR(SO(I))
974       IF(LEVLSR.NE.1)GO TO 18
975       GO TO 100
983    18 PRINT 702
1003       CALL NOYES
1023       IF(NY)40,40,20
1043    20 DO 30 I=1,NPH
1063       IPH=I
1083       CALL GENLSR(SO(I))
1103    30 CONTINUE
1123    40 RETURN
```

TABLE 10.1 (Cont)

a. Subroutine LSTLSR (Cont)

```
1130  100 PRINT 800
1132  105 INPUT,IPH
1134      IF(IPH)110,40,120
1136  110 PRINT,"PHASE DOES NOT EXIST - RETYPE"
1138      GO TO 105
1140  120 IF(IPH.GT.NPH)GO TO 110
1142      NY=1
1144      CALL GENLSR(SO(IPH))
1146      GO TO 100
1150  800 FORMAT(/" ENTER PHASE NUMBER FOR DETAILED LSR
1152     &OF THAT PHASE"/"  ENTER 0 (ZERO) FOR NO DETAIL")
1243  702 FORMAT(//" DETAILED LSR OUTPUT DESIRED FOR ALL PHASES(Y,N)")
1263  703 FORMAT(5H1000 ,2I3,"  STATIC IFRS  ",A8)
1265  710 FORMAT(//17X,"*FLIGHT INSTRUCTORS*     LSO
1266     &ADMIN    TOTAL    TOTAL"/" TRAINING PHASE    EFFECT
1267     &  IUT   TOTAL      REQMT      OFF      OFF      ENL")
1273  712 FORMAT(//16X,"* AIRCRAFT*  FUEL  GALLONS  ANN/HRS
1275     &     MO
1276C    & * ACAD.  INSTRS *
1277     &"/" TRAINING PHASE  TYPE  NO.   TYPE  - - (000)- - - -
1278C    &     EFFECT    IUT"
1279     &    FACT.")
1283      END
```

TABLE 10.1 (Cont)

b. Subroutine MODLSR

```
1303        SUBROUTINE MODLSR
1323        COMMON SWITCH(11)
1343        COMMON NAME(25,3),NPLA(25,3),NFUEL(25,3),NACD(25,3),ATP(25),
1363       &WK(25),TOD(25),NAC(25),NAD(25),WS(25,3),GAS(25,3),AU(25,3),
1383       &FU(25,3),SFH(25,3),FIH(25,3),FTR(25,3),FSO(25,3),AMO(25,3),
1403       &ASH(25,3),AIH(25,3),AITR(25,3)
1405        COMMON FUN(25,3),FIHN(25,3),FTRN(25,3)
1423        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,MPY,
1443       &AFD,KILL,IID,FID,KILLS(25),SINP(25),SO(25)
1463        COMMON IACT(3),IAFT(3),IAIN(3),BF(3),FIT(3),FI(3),
1483       &FLSO(3),EM(3),AIT(3),ACNO(3),AI(3)
1484        COMMON FITN(3),FIN(3)
1503      5 PRINT 700
1523        CALL NOYES
1543        IF(NY)10,10,20
1563     10 RETURN
1583     20 PRINT 701
1603     40 INPUT,IPH
1623        IF(IPH)50,260,60
1643     50 PRINT, " INVALID REPLY - REPEAT"
1663        GO TO 40
1683     60 IF(IPH-NPH)65,65,50
1703     65 SOUT=SO(IPH)
1723        IF(SOUT)66,66,67
1743     66 PRINT 714
1763        GO TO 5
1783     67 CALL GENLSR(SO(IPH))
1803        PRINT 703
1823     70 INPUT,IF,IE
1843        IF(IF)110,250,80
1863     80 IF(IF-3)90,90,100
1883     90 N=NAC(IPH)
1903        GO TO 130
1923    100 IF(IF-4)110,120,110
1943    110 PRINT, " INVALID REPLY - REPEAT"
1963        GO TO 70
1983    120 N=NAD(IPH)
2003    130 IF(N)220,220,140
2023    140 IF(IE)110,110,145
2043    145 IF(IE-N)150,150,110
2063    150 PRINT 705
2083    155 INPUT,D
2103        IF(D-0.1)157,157,160
2123    157 PRINT, " INVALID REPLY - REPEAT"
2143        GO TO 155
```

TABLE 10.1 (Cont)

b. Subroutine MODLSR (Cont)

```
2163   160 GO TO (170,180,190,200),IF
2183   170 V=ACNO(IE)
2203       GO TO 210
2223   180 V=FIT(IE)+FI(IE)
2243       GO TO 210
2263   190 V=EM(IE)
2283       GO TO 210
2303   200 V=AIT(IE)+AI(IE)
2323   210 IF(D-V)230,220,220
2343   220 PRINT 707
2345       GO TO 250
2363   230 S=D/V*SOUT
2383       PRINT 708,SOUT,S
2443       SINP(IPH)=SINP(IPH)*S/SOUT
2445       SOUT=S
2446       NY=0
2447       CALL GENLSR(SOUT)
2463   250 PRINT 709
2483       CALL NOYES
2503       IF(NY)255,255,252
2523   252 PRINT 713
2543       GO TO 70
2563   255 PRINT 710,(NAME(IPH,J),J=1,3)
2583       CALL NOYES
2603       IF(NY)260,260,258
2623   258 CALL GENLSR(SOUT)
2643   260 PRINT 711
2663       CALL NOYES
2683       IF(NY)270,270,20
2703   270 PRINT 712
2723       CALL NOYES
2743       IF(NY)10,10,280
2763   280 CHAIN"XLSR2*"
```

TABLE 10.1 (Cont)

b. Subroutine MODLSR (Cont)

```
2783   700 FORMAT(33H ANY LSR OUTPUT CONSTRAINTS (Y,N))
2803   701 FORMAT(17H WHICH PHASE (XX))
2823   703 FORMAT(" SELECT APPROPRIATE FIELD AND ELEMENT (X,X)"/
2843      &" 1 AIRCRAFT"/" 2 FLIGHT INSTRUCTORS"/
2863      &" 3 ENLISTED SUPPORT"/" 4 ACADEMIC INSTRUCTORS")
2903   705 FORMAT(" ENTER CONSTRAINING VALUE (XXXX.XXX)")
2923   707 FORMAT(26H VALUE IS NOT CONSTRAINING)
2943   708 FORMAT(19H OLD STUDENT OUTPUT,F6.0/19H CONSTRAINED OUTPUT,F6.
2963      &0)
2983   709 FORMAT(29H ADDITIONAL CONSTRAINTS (Y,N))
3003   710 FORMAT(21H NEW LSR SUMMARY FOR ,3A4,6H (Y,N))
3023   711 FORMAT(32H ANOTHER PHASE CONSTRAINED (Y,N))
3043   712 FORMAT(" REVISE LSR TO INCLUDE CONSTRAINTS (Y,N)")
3063   713 FORMAT(" SELECT APPROPRIATE FIELD AND ELEMENT (X,X)")
3083   714 FORMAT(" PHASE CONTAINS NO ACTIVITY")
3103       END
```

TABLE 10.1 (Cont)

c. Subroutine NOYES

```
3123        SUBROUTINE NOYES
3143        COMMON SWITCH(11)
3163        COMMON DUMMY(25,62)
3243        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER
3323     10 I=1
3343        INPUT 700,NY
3363        IF(NO-NY)30,20,30
3383     20 NY=-1*I
3403        RETURN
3423     30 I=-1
3443        IF(NYES-NY)40,20,40
3463     40 PRINT, " INVALID REPLY - REPEAT"
3483        GO TO 10
3503    700 FORMAT(A1)
3523        END
```

TABLE 10.1 (Cont)

d. Subroutine GENLSR

```
3543        SUBROUTINE GENLSR(SOUT)
3563        COMMON IYR,ISWTCH(10)
3583        COMMON NAMF(25,3),NPLA(25,3),NFUEL(25,3),NACD(25,3),ATP(25),
3603       &WK(25),TOD(25),NAC(25),NAD(25),WX(25,3),GAS(25,3),AU(25,3),
3623       &FU(25,3),SFH(25,3),FIH(25,3),FTR(25,3),FSO(25,3),AMO(25,3),
3643       &ASH(25,3),AIH(25,3),AITR(25,3)
3645        COMMON FUN(25,3),FIHN(25,3),FTRN(25,3)
3663        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IED,LEVLSR,IPH,WPY,
3683       &AFD,KILL,IID,FID,KILLS(25),SINP(25),SO(25)
3703        COMMON IACT(3),IAFT(3),IAIN(3),BF(3),FIT(3),FI(3),
3723       &FLSO(3),EM(3),AIT(3),ACNO(3),AI(3)
3725        COMMON FITN(3),FIN(3)
3743        DIMENSION U(3),T1(3),T2(3),T1N(3)
3744        NFO=ISWTCH(5)
3763        EMT=0.0
3783        IC=IID
3803        DO 10 I=1,3
3804        T1(I)=0.0 ; T2(I)=0.0
3805        T1N(I)=0.
3806        FIN(I)=0. ; FITN(I)=0.
3823        IACT(I)=IBLANK
3843        IAFT(I)=IBLANK
3863        IAIN(I)=IBLANK
3883        BF(I)=0.0
3903        FIT(I)=0.0
3923        FI(I)=0.0
3943        FLSO(I)=0.0
3963        EM(I)=0.0
3983        AIT(I)=0.0
4003        ACNO(I)=0.0
4023        U(I)=AU(IPH,I)*WX(IPH,I)*AFD
4043    10  AI(I)=0.0
4083        SI=SINP(IPH)
4103        SL=(SI*ATP(IPH)+SOUT*(1.0-ATP(IPH)))*WK(IPH)/WPY
4123        N=NAC(IPH)
4143        IF(N)95,95,20
4163    20  DO 30 I=1,N
4183        IACT(I)=NPLA(IPH,I)
4203        ACNO(I)=(SOUT*SFH(IPH,I))/(AU(IPH,I)*WX(IPH,I)*AFD)
4223        IF(FSO(IPH,I))28,28,24
4243    24  FLSO(I)=SL/FSO(IPH,I)
4263    28  IAFT(I)=NFUEL(IPH,I)
4283        BF(I)=SOUT*GAS(IPH,I)*SFH(IPH,I)
4285        IF(NFO.NE.2)GO TO 29
4302        FIN(I)=SOUT*FIHN(IPH,I)/(FUN(IPH,I)*WX(IPH,I)*AFD)
4303    29  FI(I)=(SOUT*FIH(IPH,I))/(FU(IPH,I)*WX(IPH,I)*AFD)
```

TABLE 10.1 (Cont)

d. Subroutine GENLSR (Cont)

```
4323        EM(I)=ACNO(I)*AMO(IPH,I)
4343        EMT=EMT+EM(I)
4362        FITN(I)=FIN(I)*FTRN(IPH,I)/TOD(IPH)
4363     30 FIT(I)=FI(I)*FTR(IPH,I)/TOD(IPH)
4383        FACT=1.2
4403        IF(EMT-200.)70,50,40
4423     40 IF(EMT-400.)50,60,60
4443     50 FACT=1.15
4463        GO TO 70
4483     60 FACT=1.10
4543     70 EMT=FACT*EMT
4563     95 M=NAD(IPH)
4583        IF(M)120,120,100
4603    100 DO 110 I=1,M
4623        IAIN(I)=NACD(IPH,I)
4643        AI(I)=SOUT*ASH(IPH,I)/AIH(IPH,I)
4663    110 AIT(I)=AI(I)*AITR(IPH,I)/TOD(IPH)
4683    120 TOFF=0.0
4703        DO 140 I=1,3
4704        TOFF=TOFF+FIN(I)+FITN(I)
4723    140 TOFF=TOFF+AI(I)+AIT(I)+FI(I)+FIT(I)+FLSO(I)
4743        TSP=TOFF+EMT+SL
4763        IF(TSP-560.0)142,142,144
4783    142 AM=0.0303571*TSP
4803        GO TO 148
4823    144 IF(TSP-1260.0)146,146,147
4843    146 AM=7.4 + 0.0171428*TSP
4863        GO TO 148
4883    147 AM=17.8833 + 0.0088235*TSP
4903    148 TOFF=TOFF+AM
4923        IF(-10.NE.NY)GO TO 155
4983        IC=IC+5
5003        WRITE("LSROUT",719)IC,(NAME(IPH,J),J=1,3),N
5023        IC=IC+5
5043        WRITE("LSROUT",720)IC,SI,SOUT,SL,TOFF,EMT
5063        IC=IC+5
5083        WRITE("LSROUT",722)IC,IACT,IAFT
5103        IC=IC+5
5123        WRITE("LSROUT",723)IC,ACNO
5143        IC=IC+5
5163        WRITE("LSROUT",723)IC,BF
5183        IC=IC+5
5203        WRITE("LSROUT",723)IC,(ASH(IPH,J),J=1,3)
5223        IC=IC+5
5243        WRITE("LSROUT",723)IC,U
5263        IID=IC
```

TABLE 10.1 (Cont)

d. Subroutine GENLSR (Cont)

```
5264C - - - LSR SUMMARY
5284        IF(N.LE.0)GO TO 152
5304        DO 151 I=1,N
5324        T1(1)=T1(1)+FI(I)
5344        T1(2)=T1(2)+FIT(I)
5364        T1(3)=T1(3)+FLSO(I)
5365        T1N(1)=T1N(1)+FIN(I)
5366   151  T1N(2)=T1N(2)+FITN(I)
5384   152  TOTFI=T1(1)+T1(2)
5385        TOTFIN=T1N(1)+T1N(2)
5404        PRINT 810,(NAME(IPH,J),J=1,3),T1(1),T1(2),TOTFI,
5424       & T1(3),AM,TOFF,EMT
5444   810  FORMAT(1X,3A4,F10.0,F6.0,F8.0,1X,4F8.0)
5445        IF(NFO.NE.2)GO TO 220
5446        PRINT 811,T1N(1),T1N(2),TOTFIN
5448   811  FORMAT(4X,"NFO'S",4X,F10.0,F6.0,F8.0)
5464        GO TO 220
5484   155  IF(-12.NE.NY)GO TO 180
5504        IF(N.LE.0) GO TO 158; DO 157 I=1,N
5524        T1(I)=BF(I)/1000.
5544   157  T2(I)=SFH(IPH,I)*SOUT/1000.
5564   158  PRINT 812,(NAME(IPH,J),J=1,3),IACT(1),ACNO(1),
5584       &IAFT(1),T1(1),T2(1),AMO(IPH,1)
5604C      & ,AI(1),AIT(1)
5624        IF(N-1)175,175,160
5644   160  DO 170 I=2,N
5664   170  PRINT 813,IACT(I),ACNO(I),IAFT(I),T1(I),T2(I),AMO(IPH,I)
5684C      &AI(I),AIT(I);REPLACE 3 BY N IN IF TEST IN NEXT LINE
5704   175  IF(M.LE.3)GO TO 220
5724        N=N+1
5744        DO 177 I=N,M
5764   177  PRINT 814,AI(I),AIT(I)
5784   812  FORMAT(1X,3A4,4X,A4,F6.1,2X,A4,2X,2F7.1,2X,2F7.1)
5804   813  FORMAT(17X,A4,F6.1,2X,2F7.1,2X,2F7.1)
5824   814  FORMAT(51X,2F7.1)
5844C       RETYPE THE COMMENT LINES WITHOUT THE C TO GET
5864C      ACADEMIC INSTRUCTOR DATA PRINTED. ALSO SEE
5884C      LINES 1275-1279 OF LSR3.
5904        GO TO 220
5924   180  IF(NY.EQ.0)GO TO 220
```

TABLE 10.1 (Cont)

d. Subroutine GENLSR (Cont)

```
5944        PRINT 702
5964        PRINT 703,(NAME(IPH,J),J=1,3)
5984        PRINT 704,SI
6004        PRINT 705,SOUT
6024        PRINT 706,SL
6044        PRINT 707,AM
6064        PRINT 708,TOFF
6084        PRINT 709,EMT
6104        IF(N)200,200,190
6124  190   PRINT 710,(IACT(I),I=1,N)
6144        PRINT 711,(ACNO(I),I=1,N)
6164        PRINT 712,(IAFT(I),I=1,N)
6184        PRINT 713,(BF(I),I=1,N)
6204        PRINT 714,(FI(I),I=1,N)
6224        PRINT 715,(FIT(I),I=1,N)
6244        PRINT 721,(FLSO(I),I=1,N)
6264        PRINT 716,(EM(I),I=1,N)
6284  200   IF(M)218,218,210
6304  210   PRINT 717,(IAIN(I),I=1,M)
6324        PRINT 718,(AI(I),I=1,M)
6344        PRINT 715,(AIT(I),I=1,M)
6364  218   PRINT 702
6384  220   RETURN
6404  700   FORMAT(1X,3A4,F12.0,4X,A4,F6.0,3X,A4,E10.3,F6.0,F7.0)
6424  701   FORMAT(29X,A4,F6.0,3X,A4,E10.3)
6444  702   FORMAT(//)
6464  703   FORMAT(16H NAME OF PHASE: ,3A4)
6484  704   FORMAT(14H STUDENT INPUT,F6.0)
6504  705   FORMAT(15H STUDENT OUTPUT,F6.0)
6524  706   FORMAT(21H AVERAGE STUDENT LOAD,F7.1)
6544  707   FORMAT(24H ADMINISTRATIVE OFFICERS,F6.0)
6564  708   FORMAT(15H TOTAL OFFICERS,F6.0)
6584  709   FORMAT(15H TOTAL ENLISTED,F6.0)
6604  710   FORMAT(15H AIRCRAFT TYPES,7X,3(1X,A4,4X))
6624  711   FORMAT(16H NUMBER REQUIRED,F11.0,2F9.0)
6644  712   FORMAT(11H FUEL TYPES,12X,A4,4X,A4,5X,A4)
6664  713   FORMAT(17H GALLONS CONSUMED,3X,3E9.3)
6684  714   FORMAT(19H FLIGHT INSTRUCTORS,F8.0,2F9.0)
6704  715   FORMAT(15H UNDER TRAINING,F12.0,2F9.0)
6724  716   FORMAT(17H ENLISTED SUPPORT,F10.0,2F9.0)
6744  717   FORMAT(23H ACADEMIC INSTRUCTION  ,A4,2(5X,A4))
6764  718   FORMAT(21H ACADEMIC INSTRUCTORS,F6.0,2F9.0)
6784  719   FORMAT(I4,1X,3A4,I3)
6804  720   FORMAT(I4,1X,5E13.6)
6824  721   FORMAT(17H LSO REQUIREMENTS,F10.0,2F9.0)
6844  722   FORMAT(I4,1X,6A4)
6864  723   FORMAT(I4,1X,3E13.6)
6884        END
```

TABLE 10.1 (Cont)

e. Subroutine PRECONST

```
6903        SUBROUTINE PRECONST
6913        COMMON IYR,ISWTCH(10)
6923        COMMON NAME(25,3),NPLA(25,3),NFUEL(25,3),NACD(25,3),ATP(25),
6933       &WK(25),TOD(25),NAC(25),NAD(25),WX(25,3),GAS(25,3),AU(25,3),
6943       &FU(25,3),SFH(25,3),FIH(25,3),FTR(25,3),FSO(25,3),AMO(25,3),
6953       &ASH(25,3),AIH(25,3),AITR(25,3)
6963        COMMON FUN(25,3),FIHN(25,3),FTRN(25,3)
6973        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IEE,LEVLSE,IPH,WPY,
6983       &AFD,KILL,IID,FID,KILLS(25),SINP(25),SO(25)
6993        COMMON IACT(3),IAFT(3),IAIN(3),BF(3),FIT(3),FI(3),
7003       &FLSO(3),EM(3),AIT(3),ACNO(3),AI(3)
7013        COMMON FITN(3),FIN(3)
7023C - - SIMPLE VERSION NO ATTRITON RATE USED
7033        PRINT 710
7043      5 PRINT 720
7053     10 INPUT,IPH,F
7063        IF(IPH.EQ.0)GO TO 200
7065        IF(F.LE.0.)GO TO 30
7073        IF( (IPH.GE.1).AND.(IPH.LE.NPH) )GO TO 20
7083        PRINT 700;GO TO 10
7093     20 PRINT 725,(NAME(IPH,J),J=1,3)
7103        PRINT 730
7113     22 INPUT,IOP,V
7123        IF(IOP.EQ.0)GO TO 5
7133        IF( (IOP.GE.1).AND.(IOP.LE.6) )GO TO 25
7143        GO TO 30
7153     25 IF(V)30,30,40
7163     30 PRINT 700; GO TO 22
7183C
7193     40 CALL CONST(IOP,V,HR,F,C)
7203        PRINT 750,SO(IPH),ACNO(1),HR,C,FI(1),EM(1)
7213        PRINT 760
7223        GO TO 22
7233    200 ISWTCH(4)=1
7243        CHAIN"XLSR2*"
```

TABLE 10.1 (Cont)

e. Subroutine PRECONST (Cont)

```
7253C
7263   700 FORMAT(" INVALID INPUT - RETYPE")
7273   710 FORMAT(//5X,"SIMPLE CONSTRAINT CALCULATIONS"//
7283      &" THE CONSTRAINT OPTIONS ARE:"/
7293      &"  1  STUDENT OUTPUT"/"  2  NO. OF AIRCRAFT"/
7303      &"  3  FLIGHT HRS (IN THOUSANDS)"/
7313      &"  4  COST(IN THOUSANDS) FOR FLYING"/
7315      &"  5  FLIGHT INSTRUCTORS"/
7318      &"  6  ENLIST. MAINT.(M.O. X NUMB. AIRCRAFT)"//
7323      &" ENTER 0,0 FOR NO FURTHER CONSTRAINTS OR CALCULATIONS"///)
7333   720 FORMAT(" ENTER PHASE NO. TO BE CONSTRAINED AND"/
7335      &" COST PER FLIGHT HOUR ")
7343   725 FORMAT(" PHASE: ",3A4//)
7353   730 FORMAT(" ENTER CONSTRAINT OPTION AND VALUE(X,XXX.)")
7363   750 FORMAT(" STUDS OUT ",F10.2/" A/C REQED ",F10.2/
7373      &" FLT. HRS. ",F10.2," X1000"/
7383      &" FLT. COST ",F10.2," X1000"/
7385      &" FLT.INSTR ",F10.2/
7387      &" ENL.MAINT ",F10.2//)
7393   760 FORMAT(" ANOTHER CONSTRAINT OPTION AND VALUE")
7403   300 RETURN;END
```

TABLE 10.1 (Cont)

f. Subroutine CONST

```
7413        SUBROUTINE CONST(IOP,V,HR,F,C)
7423        COMMON IYR,ISWTCH(10)
7433        COMMON NAME(25,3),NPLA(25,3),NFUEL(25,3),NACD(25,3),ATP(25),
7443       &WK(25),TOD(25),NAC(25),NAD(25),WX(25,3),GAS(25,3),AU(25,3),
7453       &FU(25,3),SFH(25,3),FIH(25,3),FTR(25,3),FSO(25,3),AMO(25,3),
7463       &ASH(25,3),AIH(25,3),AITR(25,3)
7473        COMMON FUN(25,3),FIHN(25,3),FTRN(25,3)
7483        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSE,IPH,WPY,
7493       &AFD,KILL,IID,FID,KILLS(25),SINP(25),SO(25)
7503        COMMON IACT(3),IAFT(3),IAIN(3),BF(3),FIT(3),FI(3),
7513       &FLSO(3),EM(3),AIT(3),ACNO(3),AI(3)
7523        COMMON FITN(3),FIN(3)
7533C
7540C- - - ONE AIRCRAFT TYPE ONLY
7543        I=1
7553        IF(NAC(IPH).EQ.0)GO TO 500
7563        GO TO(100,200,300,350,400,440),IOP
7573C - - STUDENTS OUTPUT GIVEN
7583   100  SOUT=V
7593   105  SO(IPH)=SOUT
7603        ACNO(I)=SOUT*SFH(IPH,I)/(AU(IPH,I)*WX(IPH,I)*AFD)
7613   110  FI(I)=SOUT*FIH(IPH,I)/(FU(IPH,I)*WX(IPH,I)*AFD)
7623        FIT(I)=FI(I)*FTR(IPH,I)/TOD(IPH)
7633        FIN(I)=0. ; FITN(I)=0.
7643        IF(FUN(IPH,I).EQ.0.)GO TO 115
7653        FIN(I)=SOUT*FIHN(IPH,I)/(FUN(IPH,I)*WX(IPH,I)*AFD)
7663        FITN(I)=FIN(I)*FTRN(IPH,I)/TOD(IPH)
7673   115  FI(I)=FI(I)+FIT(I)+FIN(I)+FITN(I)
7683        HR=SFH(IPH,I)*SOUT/1000.
7685        C=F*HR
7687        EM(I)=AMO(IPH,I)*ACNO(I)
7693        RETURN
7703C - - AIRCRAFT GIVEN
7713   200  ACNO(I)=V
7723        SOUT=ACNO(I)*AU(IPH,I)*WX(IPH,I)*AFD/SFH(IPH,I)
7733        GO TO 105
7743C - - - FLT HOURS IN THOUSANDS GIVEN
7753   300  HR=V
7763        SOUT=HR*1000./SFH(IPH,I)
7773        GO TO 105
7775C - - - COST FOR FLYING GIVEN
7776   350  C=V ; V=C/F
7777        GO TO 300
```

TABLE 10.1 (Cont)

f. Subroutine CONST (Cont)

```
7783C - - TOTAL INSTRUCTORS GIVEN
7793  400 FI(I)=V
7803      X=FIH(IPH,I)/(FU(IPH,I)*WX(IPH,I)*AFD)
7813      X=X*(1.+FTR(IPH,I)/TOD(IPH))
7815      Y=0.
7823      IF(FUN(IPH,I).EQ.0)GO TO 410
7833      Y=FIHN(IPH,I)/(FUN(IPH,I)*WX(IPH,I)*AFD)
7843      Y=Y*(1.+FTRN(IPH,I)/TOD(IPH))
7853  410 SOUT=V/(X+Y)
7863      GO TO 105
7865C - - ENLISTED MAINT.
7866  440 ACNO(I)=V/AMO(IPH,I)
7867      V=ACNO(I)
7868      GO TO 200
7873C - - NO AIRCRAFT
7883  500 SO(IPH)=0. ; ACNO(I)=0.
7893      FI(I)=0. ; HR=0.
7903      PRINT,"NO FLYING IN THIS PHASE"
7913      RETURN;END
```

# XI. PROGRAM LSR4

11.1 The listing of LSR4 appears in Table 11.1. All changes that have been made in this program are found on line numbers that end in 5. The changes are:

- Include space in the common area of storage for NFO planning factors (e.g., line 165 array SP3 (25,9)).
- Access the proper data file depending on ISWTCH(5). Note that line 105 is modified to reduce the dimension of ISWTCH for consistency with the other LSR programs.
- At line 355, additional information is written on the RUNWAY file.
- Line 435 now assures that blanks will be printed on the RUNWAY file (at line 905) for the undefined aircraft types in a phase.
- Line 905 now writes all aircraft types or blanks on the RUNWAY data file.
- Lines 1446 to 1052 permit the user to skip the runway and airspace printout.
- Spelling errors have been corrected in the format statements (lines 1344 to 1484).
- The error message in line 2325 has been changed to include the name of the data file.

TABLE 11.1

PROGRAM LSR4 LISTING

```
105       COMMON IYR,ISWTCH(10)
124       COMMON NAME(25,3),NPLA(25,3),IOPR(25,3),SAS(25,3),OLF(25,3),
144      &NAC(25),RUNP(25,3),TARG(25,3),WX(3,12),DH(12),
165      &SP1(52),SP2(25,27),SP3(25,9)
184       COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
204      &AFD,KILL,IID,FID,KILLS(25),SI(25),SO(25)
224         COMMON NAMEP(3),IAFT(3),SPS(3),SL(3),TT(3),TL(3),
244      &AS(3),ATAG(3),TAGT(3),PMR(3),TAR(3),TOT(3),DT,NACC
264      &,DTO
265       ALPHA NPLA,IAFT
275C
285       FILENAME RUN
295       IF(ISWTCH(5).EQ.1) RUN="RUNDAT"
305       IF(ISWTCH(5).EQ.2) RUN="NFORUNDA"
315       OPENFILE RUN
325       REWIND RUN
335       OPENFILE "RUNWAY"
345       REWIND "RUNWAY"
355       WRITE("RUNWAY",707)NPH,ISWTCH(5),DAT(X)
384       IL=1005
404       DO 10 I=1,NPH
424       DO 10 J=1,3
435       IF(NAC(I).LT.J)NPLA(I,J)="     "
444       IOPR(I,J)=0
464       SAS(I,J)=0.0
484       OLF(I,J)=0.0
504       RUNP(I,J)=0.0
524    10 TARG(I,J)=0.0
544       DO 115 I=1,NPH
564       IPH=I
584       IF(NAC(I))100,100,20
605    20 CALL INPRWY(RUN)
624       DO 40 J=1,3
644       IF(NAMEP(J)-NAME(I,J))30,40,30
664    30 PRINT 700,NAMEP,(NAME(I,K),K=1,3)
684       STOP
704    40 CONTINUE
724       IF(NAC(I)-NACC)50,60,50
744    50 PRINT 701,NACC,NAC(I),NAMEP
764       STOP
784    60 CONTINUE
804       DO 80 J=1,NACC
825       IF(IAFT(J).EQ.NPLA(I,J))GO TO 80
844    70 PRINT 702,NAMEP,IAFT(J),NPLA(I,J)
845       STOP
```

TABLE 11.1 (Cont)

```
884    80 CALL GENWY
905   100 WRITE("RUNWAY",708)IL,(NPLA(I,J),J=1,3)
924       IL=IL+5
944       WRITE("RUNWAY",709)IL,(RUNP(I,J),J=1,3)
964       IL=IL+5
984       WRITE("RUNWAY",709)IL,(SAS(I,J),J=1,3)
1004       IL=IL+5
1024       WRITE("RUNWAY",709)IL,(OLF(I,J),J=1,3)
1044  115 IL=IL+5
1046C
1047      PRINT 800
1048  117 INPUT 810,NY
1049      IF( (NY.EQ.NO).OR.(NY.EQ.NYES) ) GO TO 118
1050      PRINT,"INVALID REPLY - RETYPE"
1051      GO TO 117
1052  118 IF(NY.EQ.NO)GO TO 200
1064      PRINT 703
1084      DO 200 I=1,NPH
1104      IF(NAC(I).LE.0)GO TO 200
1124      PRINT 704,(NAME(I,J),J=1,3),NPLA(I,1),RUNP(I,1),SAS(I,1),
1144     & OLF(I,1),TARG(I,1)
1164      IF(NAC(I)-1)200,200,110
1184  110 K=NAC(I)
1204      DO 120 J=2,K
1224  120 PRINT 705,NPLA(I,J),RUNP(I,J),SAS(I,J),OLF(I,J),TARG(I,J)
1244      PRINT 706
1264  200 CONTINUE
1284      CLOSEFILE "RUNWAY"
1304C
1305      CLOSEFILE RUN
1306      PRINT 805
1324      CHAIN "PART2*"
1344  700 FORMAT(" RUNWAY PHASE NAME ",3A4," DOES NOT MATCH PHAS
1364     &E NAME "3A4/" REVISE AND RERUN")
1384  701 FORMAT(" RUNWAY AIRCRAFT TYPES OF",I3," DOES NOT MATCH"/
1404     &" PHASE TYPES OF",I3," FOR PHASE: "3A4/" REVISE AND RERUN")
1424  702 FORMAT(" FOR PHASE ",3A4," AIRCRAFT NAMES DO NOT MATCH
1444     &PHASE AIRCRAFT NAMES ",A4,1H,,A4/" REVISE AND RERUN")
1464  703 FORMAT(//18X,"A/C EFFECTIVE  AIRSPACE          TARGET"/
1484     &" TRAINING PHASE  TYPE  RUNWAYS  SATURATION   OLF   AREAS")
1504  704 FORMAT(1X,3A4,4X,A4,F8.3,F11.3,F8.3,F8.3)
1524  705 FORMAT(17X,F8.3,F11.3,2F8.3)
1544  706 FORMAT(1X)
1565  707 FORMAT(5H1000 ,2I3,5X,A8)
1585  708 FORMAT(I4,1X,3A4,)
1604  709 FORMAT(I4,1X,3E13.6)
1605  800 FORMAT(" PRINT RUNWAY AND AIRSPACE FACTORS (Y,N)")
1606  805 FORMAT(//)
1607  810 FORMAT(A1)
1624      END
```

TABLE 11.1 (Cont)

a. Subroutine INPRWY

```
1645       SUBROUTINE INPRWY(RUN)
1664       COMMON SWITCH(11)
1684       COMMON NAME(25,3),NPLA(25,3),IOPR(25,3),SAS(25,3),OLF(25,3),
1704      &NAC(25),RUNP(25,3),TARG(25,3),WX(3,12),DH(12),
1725      &SP1(52),SP2(25,27),SP3(25,9)
1744       COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
1764      &AFD,KILL,IID,FID,KILLS(25),SI(25),SO(25)
1784         COMMON NAMEP(3),IAFT(3),SPS(3),SL(3),TT(3),TL(3),
1804      &AS(3),ATAG(3),TAGT(3),PMR(3),TAR(3),TOT(3),DT,NACC
1824      &,DTO
1844       FILENAME RUN
1865C
1884       READ(RUN,700)L,NACC,NAMEP,IAFT
1904       IF(NACC)10,10,20
1924    10 PRINT 701,RUN
1944       STOP
1964    20 READ(RUN,702)L,(DH(J),J=1,6)
1984       READ(RUN,702)L,(DH(J),J=7,12)
2004       READ(RUN,702)L,DT,DTO
2024       DO 30 I=1,NACC
2044       READ(RUN,702)L,(WX(I,J),J=1,6)
2064    30 READ(RUN,702)L,(WX(I,J),J=7,12)
2084       READ(RUN,702)L,SPS
2104       READ(RUN,702)L,SL
2124       READ(RUN,702)L,TT
2144       READ(RUN,702)L,TL
2164       READ(RUN,702)L,AS
2184       READ(RUN,702)L,ATAG
2204       READ(RUN,702)L,TAGT
2224       READ(RUN,702)L,PMR
2244       READ(RUN,702)L,TAR
2264       READ(RUN,702)L,TOT
2284    40 RETURN
2304   700 FORMAT(2I4,6A4)
2325   701 FORMAT(" DATA FILE: ",A8," IS INCOMPLETE- UPDATE AND RERUN")
2344   702 FORMAT(V)
2364       END
```

TABLE 11.1 (Cont)

b. Subroutine GENRWY

```
2384        SUBROUTINE GENRWY
2404        COMMON SWITCH(11)
2424        COMMON NAME(25,3),NPLA(25,3),IOPR(25,3),SAS(25,3),OLF(25,3),
2444       &NAC(25),RUNP(25,3),TARG(25,3),WX(3,12),DH(12),
2465       &SP1(52),SP2(25,27),SP3(25,9)
2484        COMMON ICOMMA,IBLANK,NO,NYES,NY,NPH,IER,LEVLSR,IPH,WPY,
2504       &AFD,KILL,IID,FID,KILLS(25),SI(25),SO(25)
2524          COMMON NAMEP(3),IAFT(3),SPS(3),SL(3),TT(3),TL(3),
2544       &AS(3),ATAC(3),TAGT(3),PMR(3),TAR(3),TOT(3),DT,NACC
2564       &,DTO
2584        DO 300 I=1,NACC
2604        TIME=0.0
2624        DO 10 J=1,12
2644     10 TIME=TIME+(DH(J)-SL(I))*WX(I,J)
2664        TIME=TIME*(1.0-DT)/12.0
2684        TLC=TT(I)+TL(I)
2704        SMLC=TIME/TLC
2724        CYC=TT(I)
2744        IF(CYC-TL(I))20,20,30
2764     20 CYC=TL(I)
2784     30 C=TIME/(2.0*SL(I))
2804        J=C
2824        C=J
2844        SMTL=C*SL(I)/CYC
2864        R=TIME-2.0*C*SL(I)
2884        E=SL(I)/CYC
2904        IF(R-SL(I))40,50,50
2924     40 E=R/CYC
2944     50 SMTL=SMTL+E
2964        IF(SMLC-SMTL)60,60,70
2984     60 SMAX=SMTL
3004        IOPR(IPH,I)=2
3024        AIR=SL(I)/CYC
3044        GO TO 80
3064     70 SMAX=SMLC
3084        IOPR(IPH,I)=1
3104        AIR=SL(I)/TLC
```

TABLE 11.1 (Cont)

b. Subroutine GENRWY (Cont)

```
3124    80 ET=0.
3144       IF(AIR.GT.AS(I))GO TO 200
3164    85 SAS(IPH,I)=AIR/AS(I)
3184       IF(ATAG(I))100,100,90
3204    90 TGC=TIME*(1.-DTO)/TAGT(I)
3224       TGR=SO(IPH)*ATAG(I)/AFD
3244       OFR=(1.0-PMR(I))*TGR
3264       OLF(IPH,I)=OFR/TGC
3284       ET=(TGR-OFR)*(1.0-DTO)/TGC
3304   100 RS=SO(IPH)*SPS(I)/AFD
3324       RUNP(IPH,I)=ET + RS/SMAX
3344       IF(TAR(I))290,290,110
3364   110 GUN=SO(IPH)*TAR(I)/AFD
3384       TART=(TIME-SL(I))/TOT(I)
3404       TARG(IPH,I)=GUN/TART
3424       GO TO 300
3444   200 IF(IOPR(IPH,I).EQ.2)GO TO 70
3464       C=TIME/SL(I)
3484       J=C
3504       D=J
3524       C=C-D
3544       T=C/TLC
3564       IF(T-AS(I))220,220,210
3584   210 T=AS(I)
3604   220 SMAX=D*AS(I)+T
3624       AIR=AS(I)
3644       IOPR(IPH,I)=3
3664       GO TO 85
3684   290 SAS(IPH,I)=SAS(IPH,I)*RUNP(IPH,I)
3704   300 CONTINUE
3724       RETURN
3744       END
```

# XII. PROGRAM PART2

12.1 The listing of program PART2 appears in Table 12.1. The only change is that line 1522 is new. It was inserted and in this case the entire program was resequenced. No other changes were made.

TABLE 12.1

PROGRAM PART2 LISTING

```
999C---PART2--MØDIFIED FØR IFRS III 1-18-71
1002        CØMMØN IYEAR,ISWTCH(10)
1022        CØMMØN ACREQ(9,21),TBAS(9),TNAS(9),BPH(9,25),ASH(25,3),
1042       &ACFH(9,15),TØFF(9),TENL(9),TSTU(9),PNASE(9),SI(25),TCIV(9),
1062       &SØ(25),FUREQ(9,3),PHPER(9,5),NBUSE(9),RW(25,3,3),
1082       &IACT(25,3),ACNØ1(25,3),TØFF1(25),EMT1(25)
1102        CØMMØN IATYPE(21),ACA(21),ACB(21),ACC(21),ACD(21),
1122       &AHM(21),ACM(21),ASM1(21),ASM2(21),A(21,3),RNWYL(21),
1142       &RLØAD(21),CØMP(21),FLCST(21),AØM(21),CNAAC(21)
1162        CØMMØN NASNAM(9),AD(9),PF(9,3),EL(9,3),CU(9),IBED(9),PEE(9),
1182       &PRE(9),PØ(9),PS(9),PIE(9),TS(9),TH(9),TNØFF(9),TNENL(9),
1202       &TNCIV(9),ATCF(9),WR(9,2),TENAC(9,6),PERFAC(9),EMES(9)
1222        CØMMØN FACØST(50,6)
1242        CØMMØN FAPW(6),AP(4,3),GWTAB(3),FAMESS(7,2),EXCH(10,2),
1262       &FAEM(8,2),TANKS(15),TAXITØ(3)
1282        CØMMØN ICØDES(50),IDES(50,3),RPI(50,9,2),IUNITS(50),
1302       &XRPI1(9,10,4),XRPI2(3,9)
1322        CØMMØN BR(50,9),XBR1(9,10,4),XBR2(3,9),DEF(50,9),
1342       &XDEF2(9),XDEF3(2,9),XDEF4(3,15,9),TEX(50,9),
1362       &NCAT,IYES,NØ,ICØM,GTØTAL,NPH
1382        ALPHA ICØM,IYES,NØ,IATYPE
1402        DØ 1 I=1,21
1422        DØ 1 J=1,9
1442      1 ACREQ(J,I)=0.
1462        ICØM=","
1482        NØ="N"
1502        IYES="Y"
1522        ISWTCH(8)=0
1542        IF(ISWTCH(10).EQ.0)GØ TØ 20
1562     15 ØPENFILE "BASED*"
1582        REWIND "BASED*"
1602        DØ 18 I=1,9
1622        READ("BASED*",600)NASNAM(I)
1642        READ("BASED*",602)LINE,AD(I)
1662        READ("BASED*",602)LINE,(PF(I,J),J=1,3),(EL(I,K),K=1,3)
1682        READ("BASED*",602)LINE,CU(I),TH(I),TS(I)
1702        READ("BASED*",602)LINE,TNØFF(I),TNENL(I),TNCIV(I)
1722        READ("BASED*",602)LINE,PEE(I),PRE(I),PØ(I),PS(I),PIE(I)
1742        READ("BASED*",602)LINE,EMES(I),IBED(I),PERFAC(I)
1762        READ("BASED*",602)LINE,ATCF(I),(WR(I,J),J=1,2)
1782        READ("BASED*",602)LINE,(TENAC(I,J),J=1,6)
1802     18 CØNTINUE
1822        CLØSEFILE "BASED*"
```

TABLE 12.1 (Cont)

```
1842       ØPENFILE "ACDAT*"
1862       REWIND "ACDAT*"
1882       DØ 19 I=1,21
1902       READ("ACDAT*",600)IATYPE(I)
1922       READ("ACDAT*",606)LINE,ACA(I),ACB(I),ACC(I),ACD(I)
1942       READ("ACDAT*",606)LINE,AHM(I),ACM(I),ASM1(I),ASM2(I)
1962       READ("ACDAT*",606)LINE,(A(I,J),J=1,3)
1982       READ("ACDAT*",606)LINE,RNWYL(I),RLØAD(I),CØMP(I)
2002       READ("ACDAT*",606)LINE,FLCST(I),AØM(I)
2022    19 READ("ACDAT*",606)LINE,CNAAC(I)
2042       CLØSEFILE "ACDAT*"
2062       IF(ISWTCH(10).EQ.0)GØ TØ 30
2082       IF(ISWTCH(6).EQ.1)GØ TØ 195
2102       ØPENFILE "RETURN"
2122       REWIND "RETURN"
2142       READ("RETURN",601)ICØDES,NBUSE
2162       READ("RETURN",603)IDES,IUNITS
2182       READ("RETURN",604)RPI,XRPI1,XRPI2,FACØST,BPH,CNAAC
2202       CLØSEFILE "RETURN"
2222       IF(ISWTCH(10).EQ.2)GØ TØ 195
2242       GØ TØ 30
2262   195 ØPENFILE "RETURN1"
2282       REWIND "RETURN1"
2302       READ("RETURN1",604)BPH
2322       READ("RETURN1",601)NBUSE
2342       GØ TØ 30
2362    20 IYEAR=1970
2382       ISWTCH(6)=1
2402       GØ TØ 15
2422    30 CHAIN "PART3*"
2442   600 FØRMAT(5XA4)
2462   601 FØRMAT(8I8)
2482   602 FØRMAT(V)
2502   603 FØRMAT(15A4)
2522   604 FØRMAT(5E13.6)
2542   606 FØRMAT(V)
2562       END
```

# XIII. PROGRAMS PART3 AND PRT3N

13.1 Program PART3 was one of the largest programs in the IFRS model. When the new option to read a standard phase-to-base assignment file was added to the program, the compiled version exceeded the allowable core capacity. The problem was overcome by dividing the program into two parts—PART3 and PRT3N.

13.2 The purpose of program PART3 is to:

- Read the LSROUT file.
- Accept the phase-to-base assignments.
- Check the allocation of a phase to ensure it has been completely (100%) assigned.
- Transfer control to program PRT3N.

13.3 The purpose of program PRT3N is to:

- Compute the base loading data.
- Transfer control to PART3 if the user wants to reallocate phases.
- Transfer control to PART4 if the user wants additional cost information.

13.4 The dictionary of new variables is given in Table 13.1. The programs are listed in Tables 13.2 and 13.3. Because the logic has been changed, new flow charts are given in Figures 13.1 and 13.2.

CHANGES TO PART3

13.5 The changes and additions to PART3 are as follows:

- The user has the option to accept and change the phase-to-base assignment stored on the data file PHABA* (changes do not affect the data file).
- The data file is validated the same as it is for terminal input. However, if there is an error, the data are not used. No error message is printed.
- If the user wants to correct or modify a phase assignment, data entry instructions are printed once, i.e., if the user has not seen the instructions on this run (if ISWTCH(8)≠ 1).
- If the user returns to PART3 from PRT3N to reallocate phase, then the LSROUT file is not read again.

PROGRAM PRT3N

13.6 Program PRT3N is basically the last half of the old version of program PART3. The changes and additions are as follows:

- Subroutine MASK3 has been added (lines 5983 to 6083). The program is called at lines 1623 and 3923. This subroutine eliminates the need for the scratch file SCRI in this program. Essentially, the subroutine masks out the last 3 characters (27 bits) of the 4-character word by integer division. Thus the fuel types are still validated and accumulated on the basis of the first character in their name.
- In the old program PART3 there was an error in the logic of totaling fuel requirements (old lines 5623 to 5883). This has been corrected (see lines 3903 to 4403).

13.7 The scratch file SCRl was used only by the old PART3 program. Since it is no longer needed, it should be deleted from the user's library.

TABLE 13.1

NEW VARIABLE DICTIONARY FOR PROGRAMS
PART3 AND PRT3N

| Location | Variable Name | Dimension | Type | Description |
|---|---|---|---|---|
| PART3 | NI | 1 | I | Phase-to-base allocation input mode:<br>NI=0 for terminal input of initial assignments<br>NI=1 for reading file PHABA*<br>NI=2 for terminal input of changes or corrections |
| PART3 | IER | 1 | I | Error flag for terminal input<br>IER=1 for correct input<br>IER=2 for percent less than 0.0 or greater than 1.0<br>IER=3 for bad format<br>IER=4 for incorrect base code<br>IER=5 for incorrect phase number |
| PRT3N | GASNAM | 3 | A | Fuel type I (one character)<br>I=1,3 denotes "J," "A," "H" |
| PRT3N | IOP | 1 | A | Argument for subroutine, returns to main program with first character of fuel name |
| PRT3N | IALPHA | 1 | A | Argument for subroutine holds fuel name for phase I, type J instruction |
| PRT3N | MASKX | 1 | F | Used in subroutine for integer division |
| PRT3N | BF1C | 1 | F | Product of BF1(I,IA) and C |
| Common | ISWTCH | 10 | I | ISWTCH(8) was modified to the following:<br>ISWTCH(8)=0 for reading LSR output file<br>ISWTCH(8)=1 for reallocation of phases: skip description of how to allocate phases<br>ISWTCH(8)=2 for reallocation of phases: skip reading of LSR output file |

TABLE 13.2

PROGRAM PART3 LISTING

```
999C---PART3--MODIFIED FOR IFRS III 1-18-71
1003       COMMON IYEAR,ISWTCH(10)
1023       COMMON ACREQ(9,21),TBAS(9),TNAS(9),BPH(9,25),ASH(25,3),
1043      &ACFH(9,15),TOFF(9),TENL(9),TSTU(9),PNASE(9),SI(25),TCIV(9),
1063      &SO(25),FUREQ(9,3),PHPER(9,5),NBUSE(9),RW(25,3,3),
1083      &IACT(25,3),ACNO1(25,3),TOFF1(25),EMT1(25)
1103       COMMON IATYPE(21),ACA(21),ACB(21),ACC(21),ACD(21),
1123      &AHM(21),ACM(21),ASM1(21),ASM2(21),A(21,3),RNWYL(21),
1143      &RLOAD(21),COMP(21),FLCST(21),AOM(21),CNAAC(21)
1163       COMMON NASNAM(9),AD(9),PF(9,3),EL(9,3),CU(9),IBED(9),PEE(9),
1183      &PRE(9),PO(9),PS(9),PIE(9),TS(9),TH(9),TNOFF(9),TNENL(9),
1203      &TNCIV(9),ATCF(9),WR(9,2),TENAC(9,6),PERFAC(9),EMES(9)
1223       COMMON FACOST(50,6)
1243       COMMON FAPW(6),AP(4,3),GWTAB(3),FAMESS(7,2),EXCH(10,2),
1263      &FAEM(8,2),TANKS(15),TAXITO(3)
1283       COMMON ICODES(50),IDES(50,3),RPI(50,9,2),IUNITS(50),
1303      &XRPI1(9,10,4),XRPI2(3,9)
1323       COMMON BR(50,9),XBR1(9,10,4),XBR2(3,9),DEF(50,9),
1343      &XDEF2(9),XDEF3(2,9),XDEF4(3,15,9),TEX(50,9),
1363      &NCAT,IYES,NO,ICOM,GTOTAL,NPH
1383       COMMON OOUT(25),TPCT(25),PNAS(4),OUT1(25,3),
1403      &TDATA(9,4),ATYPE(20),FTYPE(20),PLREQ(20),
1423      &SL(25),GAREQ(20),BCFH(25,3),
1443      &BF1(25,3),FUEL(25,3),NAME(25,3),NAC(25)
1463      &,IAFT(25,3),XBAS(4),HRSREQ(20)
1483       ALPHA AA,ICOM,ICOM1,ICOM2,IYES,NO,ATYPE,FTYPE,
1503      &NASNAM,NAME,IACT,IAFT,IOP,IATYPE
1523       FILENAME T1
1543       IF(ISWTCH(8).NE.0) GO TO 3
1563       ISWTCH(8)=2
1583       OPENFILE "LSROUT"
1603       REWIND "LSROUT"
1623       READ("LSROUT",651)NPH
1643       DO 2 I=1,NPH
1663       READ("LSROUT",652)(NAME(I,J),J=1,3),NC(I)
1683       READ("LSROUT",653)SI(I),SO(I),SL(I),TOFF1(I),EMT1(I)
1703       READ("LSROUT",629)(IACT(I,J),J=1,3),(IAFT(I,J1),J1=1,3)
1723       READ("LSROUT",630)(ACNO1(I,J),J=1,3)
1743       READ("LSROUT",630)(BF1(I,J),J=1,3)
1763       READ("LSROUT",630)(ASH(I,J),J=1,3)
1783       READ("LSROUT",630)(BCFH(I,J),J=1,3)
1803     2 CONTINUE
1823       CLOSEFILE "LSROUT"
```

TABLE 13.2 (Cont)

```
1843     3 IF(ISWTCH(10).GT.0) GO TO 500
1863     4 DO 5 I=1,25
1883       DO 5 J=1,9
1903     5 BPH(J,I)=0.
1923       PRINT 725
1943       CALL NOYES($7,$8)
1963     7 IF(ISWTCH(8).NE.1) GO TO 11
1983       NI=0
2003       GO TO 10
2023     8 T1="PHABA*"
2043       OPENFILE T1
2063       REWIND T1
2083       NI=1
2103       READ(T1,735)
2123       READ(T1,735)
2143       PRINT 730
2163     9 READ(T1,735,END=100)IPH,ICOM1,AA,ICOM2,PCT
2183       GO TO 14
2203    10 PRINT,"TYPE FIRST BASE ASSIGNMENT"
2223       GO TO 13
2243    11 NI=0
2263    12 PRINT 600
2283       ISWTCH(8)=1
2303    13 INPUT 601,IPH,ICOM1,AA,ICOM2,PCT
2323    14 IER=1
2343       IF(IPH.EQ.0) GO TO 100
2363       IF((PCT.LT.0.0).OR.(PCT.GT.1.)) IER=2
2383       IF(ICOM2.NE.ICOM) IER=3
2403       IF(ICOM1.NE.ICOM) IER=3
2423       DO 20 I=1,9
2443       IF(AA.NE.NASNAM(I)) GO TO 20
2463       K=I
2483       GO TO 30
2503    20 CONTINUE
2523       IER=4
2543    30 IF((IPH.LT.0).OR.(IPH.GT.NPH)) IER=5
2563       IF(NI.EQ.1) GO TO 35
2583       GO TO (80,40,50,60,70),IER
2603    35 IF(IER.GT.1) GO TO 9
2623       GO TO 80
2643    40 PRINT 605,PCT
2663       GO TO 13
2683    50 PRINT 602
```

TABLE 13.2 (Cont)

```
2703        GO TO 13
2723    60  PRINT 604
2743        GO TO 13
2763    70  PRINT 608
2783        GO TO 13
2803    80  BPH(K,IPH)=PCT
2823        IF(NI.EQ.1) GO TO 85
2843        PRINT 606
2863        GO TO 13
2883    85  PRINT 740,IPH,AA,PCT
2903        GO TO 9
2923   100  IF(NI.EQ.2) GO TO 138
2943        PRINT 628
2963        CALL NOYES($138,$135)
2983   135  PRINT 627
3003        NI=2
3023        IF(ISWTCH(8).EQ.0) GO TO 12
3043        PRINT 624
3063        GO TO 13
3083   138  DO 140 I=1,25
3103        TPCT(I)=0.
3123        DO 140 J=1,9
3143   140  TPCT(I)=TPCT(I)+BPH(J,I)
3163        DO 160 I=1,NPH
3183        IF (TPCT(I)-.995)150,145,145
3203   145  IF(TPCT(I)-1.005)160,160,147
3223   147  K=I
3243        GO TO 165
3263   150  K=I
3283        GO TO 170
3303   160  CONTINUE
3323        GO TO 190
3343   165  PRINT 625,K
3363        DO 167 I=1,9
3383   167  BPH(I,K)=0.
3403        IF(ISWTCH(8).EQ.0) GO TO 12
3423        GO TO 13
3443   170  PRINT 607,K
3463        IF(ISWTCH(8).EQ.0) GO TO 12
3483        GO TO 13
3503   190  DO 198 I=1,9
3523        TEMP=0.
3543        DO 195 J=1,25
3563   195  TEMP=TEMP+BPH(I,J)
```

TABLE 13.2 (Cont)

```
3583        IF(TEMP-.01)196,196,197
3603   196  NBUSE(I)=0
3623        GO TO 198
3643   197  NBUSE(I)=1
3663   198  CONTINUE
3683        GO TO 520
3703   500  PRINT 626
3723        IF(ISWTCH(6).EQ.1)ISWTCH(10)=0
3743        CALL NOYES($4,$520)
3763   520  CHAIN "PRT3N*"
3783C-------------------
3803   600  FORMAT(" PHASE ALLOCATION:  ASSIGN EACH PHASE AS--"/1X
3823       &"II,AAAA,.XX"/1X"WHERE: II = PHASE (2 DIGITS); AAAA = BASE"
3843       &" CODE;"/7X".XX = PERCENT AT BASE (1.0 = 100%)"/1X
3863       &"BASE CODES: CHAS CORP ELLY"/13X"KING MERI PENS"/13X
3883       &"SAUF WHIT PHAN"/" II = 0 TO TERMINATE:")
3903   601  FORMAT(I2,A1,A4,A1,F3.2)
3923   602  FORMAT(22H BAD FORMAT--TRY AGAIN)
3943   604  FORMAT(30H INCORRECT BASE CODE---CORRECT)
3963   605  FORMAT(10H THE VALUE1XF6.2,1X45HGIVEN FOR PERCENT CANNOT EXCE
3983       &ED 1.0---CORRECT)
4003   606  FORMAT("+NEXT")
4023   607  FORMAT( 7H PHASE I2," HAS NOT BEEN ASSIGNED OR IS"/" ONLY"
4043       &" PARTLY ASSIGNED---CORRECT")
4063   608  FORMAT(" NO SUCH PHASE---CORRECT")
4083   624  FORMAT(" ENTER FIRST CORRECTION")
4103   625  FORMAT(" PHSAE" I2," HAS BEEN OVER-ASSIGNED. ALL ALLOCATIONS"
4123       &" OF THIS PHASE"/" ARE ELIMINATED. RE-ENTER THE COMPLETE"
4143       &" ALLOCATION")
4163   626  FORMAT(" KEEP SAME PHASE TO BASE ASSIGNMENT(Y,N)")
4183   627  FORMAT(" *CAUTION: IF YOU REASSIGN A PHASE, YOU MUST"/
4203       &" *DELETE OR CHANGE THE OLD ASSIGNMENT."/
4223       &" *(TO DELETE ENTER 0.0%)"//)
4243   628  FORMAT(/" ANY CHANGES OR CORRECTIONS(Y,N)")
4263   629  FORMAT(5X6A4)
4283   630  FORMAT(5X3E13.6)
4303   725  FORMAT(" USE THE STANDARD PHASE TO BASE ALLOCATION(Y,N)")
4323   730  FORMAT(" STANDARD ALLOCATION"//1X"PHASE"1X"BASE"1X"PERCENT")
4343   735  FORMAT(6X,I2,A1,A4,A1,F4.2)
4363   740  FORMAT(3X,I2,2X,A4,4X,F4.2)
4383   651  FORMAT(5XI3)
4403   652  FORMAT(5X3A4,I3)
4423   653  FORMAT(5X5E13.6)
4443        END
```

TABLE 13.2 (Cont)

```
4463        SUBROUTINE NOYES(*,*)
4483        ALPHA N
4503     10 INPUT, N
4523        IF(N.EQ."N") RETURN 1
4543        IF(N.EQ."Y") RETURN 2
4563        PRINT 20
4583     20 FORMAT(1X24HINVALID REPLY---CORRECT)
4603        GO TO 10
4623        END
```

TABLE 13.3

PROGRAM PRT3N LISTING

```
999C---PRT3N--CONTINUATION OF PART3--MODIFIED FOR IFRS III 1-18-71
1003       COMMON IYEAR,ISWTCH(10)
1023       COMMON ACREQ(9,21),TBAS(9),TNAS(9),BPH(9,25),ASH(25,3),
1043      &ACFH(9,15),TOFF(9),TENL(9),TSTU(9),PNASE(9),SI(25),TCIV(9),
1063      &SO(25),FUREQ(9,3),PHPER(9,5),NBUSE(9),RW(25,3,3),
1083      &IACT(25,3),ACNO1(25,3),TOFF1(25),EMT1(25)
1103       COMMON IATYPE(21),ACA(21),ACB(21),ACC(21),ACD(21),
1123      &AHM(21),ACM(21),ASM1(21),ASM2(21),A(21,3),RNWYL(21),
1143      &RLOAD(21),COMP(21),FLCST(21),AOM(21),CNAAC(21)
1163       COMMON NASNAM(9),AD(9),PF(9,3),EL(9,3),CU(9),IBED(9),PEE(9),
1183      &PRE(9),PO(9),PS(9),PIE(9),TS(9),TH(9),TNOFF(9),TNENL(9),
1203      &TNCIV(9),ATCF(9),WR(9,2),TENAC(9,6),PERFAC(9),EMES(9)
1223       COMMON FACOST(50,6)
1243       COMMON FAPW(6),AP(4,3),GWTAB(3),FAMESS(7,2),EXCH(10,2),
1263      &FAEM(8,2),TANKS(15),TAXITO(3)
1283       COMMON ICODES(50),IDES(50,3),RPI(50,9,2),IUNITS(50),
1303      &XRPI1(9,10,4),XRPI2(3,9)
1323       COMMON BR(50,9),XBR1(9,10,4),XBR2(3,9),DEF(50,9),
1343      &XDEF2(9),XDEF3(2,9),XDEF4(3,15,9),TEX(50,9),
1363      &NCAT,IYES,NO,ICOM,GTOTAL,NPH
1383       COMMON OOUT(25),TPCT(25),PNAS(4),OUT1(25,3),
1403      &TDATA(9,4),ATYPE(20),FTYPE(20),PLREQ(20),
1423      &SL(25),GAREQ(20),BCFH(25,3),
1443      &BF1(25,3),FUEL(25,3),NAME(25,3),NAC(25)
1463      &,IAFT(25,3),XBAS(4),HRSREQ(20)
1483       ALPHA AA,ICOM,ICOM1,ICOM2,IYES,NO,ATYPE,FTYPE,
1503      &NASNAM,NAME,IACT,IAFT,IATYPE,IOP,GASNAM
1523C
1543       DIMENSION GASNAM(3)
1563       DATA GASNAM/"J","A","H"/
1583       MASKX=2**27
1603       DO 20 I=1,3
1623       CALL MASK3(GASNAM(I),IOP,MASKX)
1643    20 GASNAM(I)=IOP
1663C
1683       DO 1000 I=1,9
1703       TDATA(I,1)=TNOFF(I)
1723       TDATA(I,2)=TNENL(I)
1743       TDATA(I,3)=TNCIV(I)
1763  1000 TDATA(I,4)=TDATA(I,1)+TDATA(I,2)+TDATA(I,3)
1783   520 PRINT,"SKIP DETAILED BASE LOADING DATA(Y,N)"
1803       NODETL=0
1823   200 INPUT,IOP
```

TABLE 13.3 (Cont)

```
1843       IF(IOP.EQ.IYES) GO TO 205
1863       IF(IOP.EQ.NO) GO TO 210
1883       PRINT,"INVALID REPLY--TRY AGAIN"
1903       GO TO 200
1923   205 NODETL=1
1943       PRINT 665
1963   210 DO 400 IB=1,9
1983       IF(NBUSE(IB))400,400,265
2003   265 K=0
2023       IF(NODETL.EQ.1)GO TO 267
2043       PRINT 715,NASNAM(IB)
2063   267 DO 280 I=1,NPH
2083       C=BPH(IB,I)
2103       IF(C-.01)280,280,270
2123   270 K=K+1
2143       OOUT(K)=C*SL(I)
2163       OUT1(K,1)=C*TOFF1(I)
2183       OUT1(K,2)=C*EMT1(I)
2203       OUT1(K,3)=OUT1(K,1)+OUT1(K,2)+OOUT(K)
2223       IF(NODETL.EQ.1)GO TO 280
2243       PRINT 716,(NAME(I,J),J=1,3),OOUT(K),(OUT1(K,J),J=1,3)
2263   280 CONTINUE
2283       SUM1=0.
2303       SUM2=0.
2323       SUM3=0.
2343       SUM4=0.0
2363       DO 284 I=1,K
2383       SUM1=SUM1+OUT1(I,1)
2403       SUM2=SUM2+OUT1(I,2)
2423       SUM4=SUM4+OOUT(I)
2443   284 SUM3=SUM3+OUT1(I,3)
2463       TSTU(IB)=SUM4
2483       PHPER(IB,1)=SUM1+SUM4
2503       PHPER(IB,2)=SUM2
2523       IF(NODETL.EQ.1)GO TO 2084
2543       PRINT 718,SUM4,SUM1,SUM2,SUM3
2563       PRINT 719,(TDATA(IB,J),J=1,4)
2583  2084 PNAS(4)=518.4+.259*(TDATA(IB,4)+SUM3)
2603       PNAS(2)=407.9+.0939*(TDATA(IB,4)+SUM3)
2623       PNAS(1)=19.23+.1765*(TDATA(IB,1)+SUM1)
2643       PNASE(IB)=PNAS(2)
2663       TNAS(IB)=PNAS(4)
2683       PNAS(3)=PNAS(4)-PNAS(1)-PNAS(2)
```

TABLE 13.3 (Cont)

```
2703        PHPER(IB,3)=PNAS(1)
2723        PHPER(IB,4)=PNAS(2)
2743        PHPER(IB,5)=PNAS(3)
2763        XBAS(1)=PNAS(1)+TDATA(IB,1)+SUM1
2783        XBAS(2)=PNAS(2)+TDATA(IB,2)+SUM2
2803        XBAS(3)=PNAS(3)+TDATA(IB,3)
2823        TCIV(IB)=XBAS(3)
2843        TOFF(IB)=XBAS(1)
2863        TENL(IB)=XBAS(2)
2883        XBAS(4)=PNAS(4)+TDATA(IB,4)+SUM3
2903        TBAS(IB)=XBAS(4)
2923        IF(NODETL.EQ.1)GO TO 2085
2943        PRINT 720,(PNAS(I),I=1,4),(XBAS(J),J=1,4)
2963  2085  K=0
2983        NF=1
3003        DO 300 I=1,NPH
3023        IF(NAC(I).EQ.0)GO TO 300
3043        C=BPH(IB,I)
3063        JLOW=1
3083        IF(C-.01)300,300,285
3103   285  IF(NF-1)286,286,288
3123   286  K=K+1
3143        ATYPE(K)=IACT(I,1)
3163        PLREQ(K)=ACNO1(I,1)*C
3183        HRSREQ(K)=BCFH(I,1)*C
3203        NF=2
3223        IF(NAC(I)-1)300,300,287
3243   287  JLOW=2
3263   288  JHI=NAC(I)
3283        DO 293 J=JLOW,JHI
3303        L=1
3323   289  IF(IACT(I,J).NE.ATYPE(L))GO TO 291
3343        PLREQ(L)=PLREQ(L)+ACNO1(I,J)*C
3363        HRSREQ(L)=HRSREQ(L)+BCFH(I,J)*C
3383        GO TO 293
3403   291  L=L+1
3423        IF(L-K)289,289,292
3443   292  K=K+1
3463        ATYPE(K)=IACT(I,J)
3483        PLREQ(K)=ACNO1(I,J)*C
3503        HRSREQ(K)=BCFH(I,J)*C
3523   293  CONTINUE
3543   300  CONTINUE
```

TABLE 13.3 (Cont)

```
      L1=K
      IF(K.EQ.0)NOAC=1
      DO 301 I=16,21
      IX=I-15
      IF(TENAC(IB,IX).LT..01)GO TO 301
      K=K+1
      ATYPE(K)=IATYPE(I)
      PLREQ(K)=TENAC(IB,IX)
  301 CONTINUE
      KF=0
      DO 310 I=1,3
  310 FUREQ(IB,I)=0.
      DO 350 I=1,NPH
      C=BPH(IB,I)
      IF(C-.01)350,350,315
  315 IF(NAC(I).EQ.0)GO TO 350
      JHI=NAC(I)
      DO 345 IA=1,JHI
      CALL MASK3(IAFT(I,IA),IOP,MASKX)
C- - -VALIDATE FUEL TYPE
      DO 320 IT=1,3
      IF(GASNAM(IT).EQ.IOP)GO TO 325
  320 CONTINUE
      PRINT 322,IAFT(I,IA),I
  322 FORMAT(/" ** FUEL NAME: ",A4," IN PHASE ",I2," IS OF
     & UNKNOWN TYPE"//)
      GO TO 345
C- - -FOUND VALID FUEL TYPE. TYPE NUMBER IT
  325 BF1C=BF1(I,IA)*C
      IF(KF.EQ.0)GO TO 340
C- - -COMPARE WITH FTYPE LIST
      DO 335 J=1,KF
      IF(IAFT(I,IA).NE.FTYPE(J))GO TO 335
      GAREQ(J)=GAREQ(J)+BF1C
      FUREQ(IB,IT)=FUREQ(IB,IT)+BF1C
      GO TO 345
  335 CONTINUE
C- - -ADD NEW FUEL TYPE TO LIST IN FTYPE
  340 KF=KF+1
      FTYPE(KF)=IAFT(I,IA)
      GAREQ(KF)=BF1C
      FUREQ(IB,IT)=BF1C
  345 CONTINUE
  350 CONTINUE
```

TABLE 13.3 (Cont)

```
4443        DO 372 I=16,21
4463        IK=I-15
4483        J=IFIX(AOM(I)+.005)
4503   372  FUREQ(IB,J)=FUREQ(IB,J)+TENAC(IB,IK)*FLCST(I)
4523        IF(NODETL.EQ.1)GO TO 375
4543        PRINT 619
4563        PRINT 620,(ATYPE(I),PLREQ(I),I=1,K)
4583   375  DO 380 I=1,K
4603        DO 380 J=1,15
4623        IF(ATYPE(I).NE.IATYPE(J))GO TO 380
4643        ACREQ(IB,J)=PLREQ(I)
4663        ACFH(IB,J)=HRSREQ(I)
4683   380  CONTINUE
4703        DO 385 I=16,21
4723        J=I-15
4743   385  ACREQ(IB,I)=TENAC(IB,J)
4763        IF(NODETL.EQ.1)GO TO 390
4783        PRINT 621
4803        PRINT 622,(FUREQ(IB,I),I=1,3)
4823        GO TO 400
4843   390  WAG=GAREQ(1)*1.E-6
4863        IF(NOAC.EQ.1)GO TO 398
4883        PRINT 660,NASNAM(IB),TSTU(IB),SUM3,TNAS(IB),
4903       &TOFF(IB),TENL(IB),TCIV(IB),TBAS(IB),ATYPE(1),PLREQ(1),
4923       &FTYPE(1),WAG
4943        IF(L1.EQ.1)GO TO 400
4963        DO 395 J1=2,L1
4983        WAG=GAREQ(J1)*1.E-6
5003        IF((K.GE.J1).AND.(KF.GE.J1))PRINT 661,ATYPE(J1),PLREQ(J1),
5023       &FTYPE(J1),WAG
5043        IF((K.LT.J1).AND.(KF.GE.J1))PRINT 662,FTYPE(J1),WAG
5063        IF((K.GE.J1).AND.(KF.LT.J1))PRINT 663,ATYPE(J1),PLREQ(J1)
5083   395  CONTINUE
5103        GO TO 400
5123   398  PRINT 660,NASNAM(IB),TSTU(IB),SUM3,TNAS(IB),TOFF(IB),
5143       &TENL(IB),TCIV(IB),TBAS(IB)
5163        NOAC=0
5183   400  CONTINUE
5203        PRINT 609
5223   410  INPUT,IOP
5243        IF(IOP.EQ.IYES)GO TO 502
5263        IF(IOP.EQ.NO)CHAIN "PART4*"
5283        PRINT 628
```

TABLE 13.3 (Cont)

```
5303       GO TO 410
5323   502 CHAIN "PART3*"
5343   609 FORMAT(//" REALLOCATE PHASES(Y,N)")
5363   619 FORMAT( //14H AIRCRAFT DATA/1X4HTYPE 4X3HNO.)
5383   620 FORMAT(1XA4,2XF5.0)
5403   621 FORMAT( //10H FUEL DATA/1X4HTYPE2X7HGALLONS)
5423   622 FORMAT(1X"JET "1XE9.3/1X"AGAS"1XE9.3/1X"HELO"1XE9.3)
5443   628 FORMAT(1X24HINVALID REPLY---TRY AGAIN)
5463   650 FORMAT(A4,5E12.6/4E12.6,I1/6E12.6/6E12.6/E12.6)
5483   654 FORMAT(75A1)
5503   655 FORMAT(A4,6E12.6/6E12.6)
5523   660 FORMAT(1XA4,F6.0,F7.0,F7.0,3F6.0,F7.0,1XA4,F5.0,1XA4,F7.2)
5543      &F4.0,A4,1X1PE8.3)
5563   661 FORMAT(51XA4,F5.0,1XA4,F7.2)
5583   662 FORMAT(61XA4,F7.2)
5603   663 FORMAT(51XA4,F5.0)
5623   665 FORMAT(1X"BASE LOADING SUMMARY"/1X"*PERSONNEL"38X
5643      &3X"*AIRCRAFT *FUEL"/6X"STD.  "12(1H-)"BASE  TOTALS "
5663      &12(1H-)10X"MILLION GAL."/1X"NAS  LOAD  PHASE
5683      &NAS    OFF    ENL    CIV  TOTAL  TYPE  NO. TYPE AMOUNT")
5703   715 FORMAT(///1X"NAS--"A4/1X55HPERSONNEL     STD.LOAD
5723      & OFFI
5743      &CERS ENLISTED CIVILIAN  TOTAL)
5763   716 FORMAT(1X,3A4,F6.0,F10.0,F9.0,9X,F9.0)
5783   718 FORMAT(13H ALL PHASES  ,F6.0,F10.0,F9.0,9X,F9.0/)
5803   719 FORMAT(13H TENANTS     ,6X,F10.0,3F9.0)
5823   720 FORMAT(13H NAS PERS.   ,6X,F10.0,3F9.0/
5843      &       13H TOTAL BASE  ,6X,F10.0,3F9.0)
5863   725 FORMAT(" DO YOU WANT TO USE THE STANDARD PHASE TO BASE"
5883      &," ALLOCATION")
5903   730 FORMAT(" STANDARD ALLOCATION"//1X"PHASE"1X"BASE"1X"PERCENT")
5923   735 FORMAT(5X,I2,A1,A4,A1,F3.2)
5943   740 FORMAT(3X,I2,2X,A4,4X,F3.2)
5963       END
```

TABLE 13.3 (Cont)

```
5983        SUBROUTINE MASK3(IALPHA,IFIRST,MASKX)
6003C- - -RETURNS WITH FIRST CHARACTER OF IALPHA IN IFIRST
6023C       TREAT ALPHA VARIABLE AS INTEGER. MASKX KNOCKS OFF
6043C       LAST 27 BITS BY INTEGER DIVISION.
6063        IFIRST=(IALPHA/MASKX)*MASKX
6083        RETURN;END
```

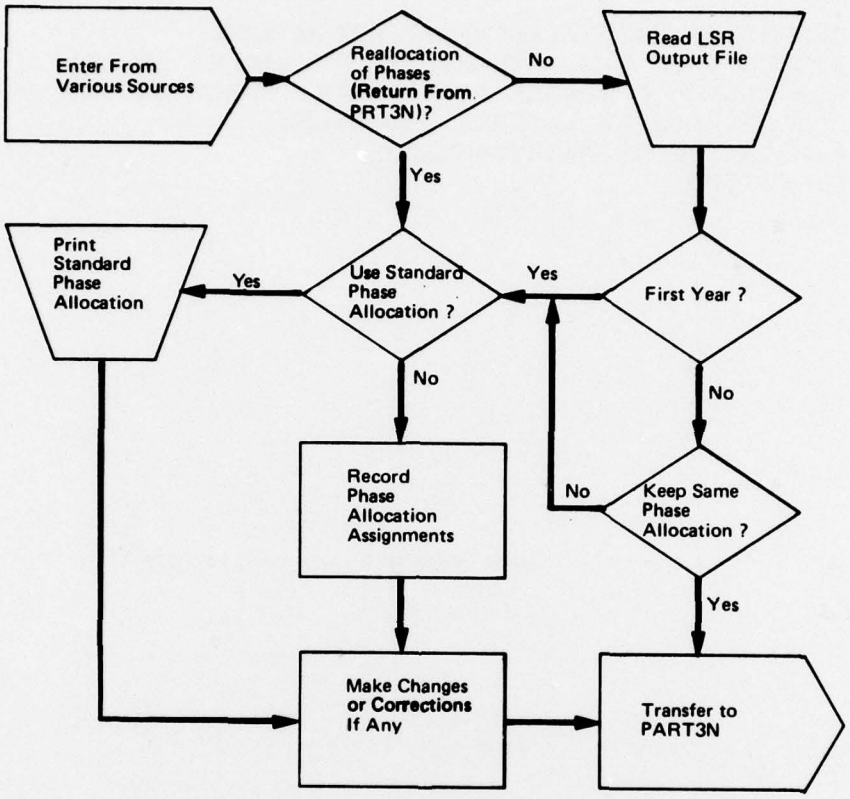


FIGURE 13.1. PART3 FLOW CHART

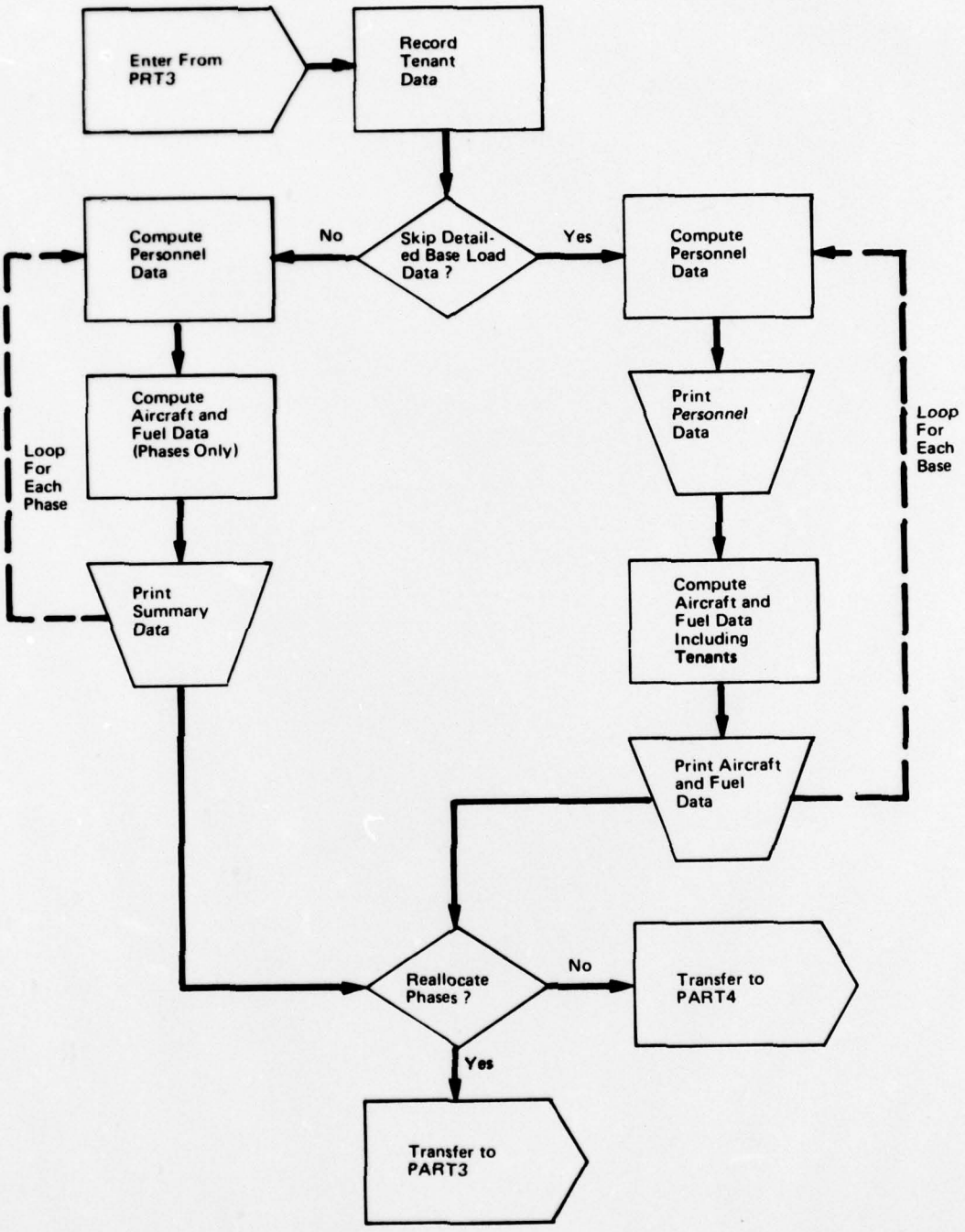


FIGURE 13.2. PRT3N FLOW CHART

## XIV. PROGRAM PART4

14.1 The following addition was made to PART4 to ensure that zeros are initially in the array XBR1.

```
3714        DO 16 I=1,9
3716        DO 16 J=1,10
3718        DO 16 K=1,4
3720    16  XBR1(I,J,K)=0
```

# XV. PROGRAM PARTY

15.1 The following changes were made to program PARTY to eliminate the possibility of a zero subscript occurring at line 12671. This has happened on an NFO run where the runway requirements are very small at the PHANTOM base.

```
10835       M=0

12515       IF(MT.EQ.0)GO TO 450
```

# XVI. PROGRAM PART5

16.1 The following changes and corrections were made to program PART5.

```
1265        PRINT,"TYPE 1 FOR O&M COST SUM. & TOTAL SYSTEM COST(TSC) ONLY"
1855        DO 80 J=1,21
2015    82  BR(6,NB)=(PWP/100)*FAPW(1)
2125        DO 120 J=1,21
```

The first line is the new print option. The next three lines correct previous errors.

# XVII. PROGRAM PART7

17.1 The following additions were made to program PART7 to print a new cost total.

```
3177        X=0.
6697        IF(ISWTCH(9).EQ.1)JUMP=1
6700        IF(ISWTCH(9).EQ.2)JUMP=1
6909        ADD1=0
6911        ADD2=0
6913        ADD3=0
6915        ADD4=0
6930        ADD1=ADD1+CNAAC(I)
6950        ADD2=ADD2+TOTAC(I)
7030        ADD3=ADD3+COST1
7050        ADD4=ADD4+COST2
7190        IF(JUMP.EQ.0)PRINT 603,ADD1,ADD2,DEFAC,ADD3,ADD4,TCOST
7670  603 FORMAT(" TOTAL",F7.0,F9.0,F8.0,3F9.0)
```

Line 3127 was deleted and line 3177 is a correction.

# XVIII. PROGRAM PART9

18.1 The following changes and additions were made to PART9 to print out a new cost total.

```
1479        IF(ISWTCH(9).EQ.1)ISA=1
1831        TOTAL1=0
1833        TOTAL2=0
1835        TOTAL3=0
1837        TOTAL4=0
2929        TOTAL1=TOTAL1+COST2
2931        TOTAL2=TOTAL2+COST3
2933        TOTAL3=TOTAL3+ACOST
2935        TOTAL4=TOTAL4+BSUPP
2937     80 SUB3=SUB3+SUB1
2969        PRINT 616,TOTAL1,TOTAL2,TOTAL3,TOTAL4,SUB3
3769    600 FORMAT(1X"SUMMARY O & M COST"//1X"NAS      "
3789       &"MILITARY      A/C FUEL     A/C O&M        BASE"/11X
3809       &"P&A",10X"TOTAL",6X"TOTAL",5X"SUPPORT",5X"TOTAL")
4109    614 FORMAT(1XA4,2XF10.1,1X4(1XF10.1))
4149    616 FORMAT(1X"TOTAL",1XF10.1,1X4(1XF10.1))
```